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ABSTRACT

This report describes the formulation of a conceptual base for conducting research on elementary school children's orientation toward their environment and details procedures for developing a battery of instruments for measuring these orientations. A definition of environmental orientations is formulated. This definition is used to focus construction of instruments to generate information about elementary and middle school children's orientation towards their environment. Development (pilot and field-test) procedures are presented for three instruments. "Our World of Today/Tomorrow" uses a semantic differential to approximate children's orientation to the present and future world situation. "The Environment and Pollution" uses a Likert scale to approximate student's orientation to general pollution and environmental problems. "The Environmental Decisions Inventory" uses a Likert response format to approximate children's orientation to alternative solutions to specific environmental problems. Estimates of validity, stability, and reliability, and factor analyses are presented. (Author/BT)

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Final Report

Project No. 2-E-026
Grant No. OEG-5-72-0045(509)

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Madison, Wisconsin 53706

THE DEVELOPMENT OF AN INSTRUMENT FOR DETERMINING THE NATURE OF ELEMENTARY SCHOOL CHILDREN'S ENVIRONMENTAL DECISIONS

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May 1974

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ERRATA

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(Regional Research Program)

The following statement is a continuation of the last paragraph on page 20.

> . . . essentially evaluative such as good-bad or littered or neat. While other adjectives describe potency, understandability and activity. Attitude and value studies usually select adjectives which load heavily on the evaluative factor. Since this instrument would be used in determining the "global" ORIENTATION of individuals toward their world, evaluative adjectives were considered appropriate.

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE

Office of Education
National Center for Educational Research and Development

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ABSTRACT

This report describes the formulation of a conceptual base for conducting research on elementary school children's orientations toward their environment and details procedures for developing a battery of instruments for measuring these orientations.

A definition of environmental orientations is formulated, predicated on the position that it is not possible to separate cognitive and affective inputs which influence responses to environmental problems. This definition is used to focus construction of instruments to generate information about elementary and middle school children's orientations toward their environments.

Development (pilot and field-test) procedures are presented for three instruments. "Our World of Today/Tomorrow" uses a semantic differential to approximate children's orientations to the present and future world situation. "The Environment and Pollution" uses a Likert scale to approximate student's orientations to general pollution and environmental problems. And, "The Environmental Decisions Inventory" uses a Likert response format to approximate children's orientations to alternative solutions to specific environmental problems such as overpopulation. Estimates of validity, stability, and reliability, and factor analyses are presented.

The tests are usable for conducting research and development work in environmental education and the position of using "environmental orientations" as the basis for research is credible. There are indications that SES, age, etc. operate differentially as the degree of specificity and proximity of the environmental situation varies.

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In a project of this magnitude the number of individuals and institutions involved grows rapidly as the work progresses. Such was the case here. But there is one group which was critical to completion of the project. Without their input there would not have been a project. These were the students, teachers, and administrators at the participating schools who gave willingly of their time and talents to generate the data base for conducting the analyses which produced the instrument battery. Our special thanks to these many individuals from Cataract, Green Bay, Milwaukee, Muskego, Oregon, Racine, Seymour, and Sparta, Wisconsin.

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CHAPTER I

INTRODUCTION

"... a certain measure of transformation of terrestrial surface, of suppression of natural and stimulation of artificially modified productivity becomes necessary. This measure man has unfortunately exceeded."

-George Perkins Marsh (1864)

"Any living thing that hopes to live on the earth must fit into the ecosphere or perish. The environmental crisis is a sign that the finely sculptured fit between life and its surroundings has begun to corrode."

-Barry Commoner (1971)

Over a century ago insightful persons such as Marsh realized that man's actions toward his environment were to have adverse impact. But man failed to take heed. He has persisted in making a series of socio-economic decisions with a view toward himself as the conqueror. This dominance posture has brought us to the present environmental crisis. Evidence of the nature and magnitude of this crisis and its causes can be found in the writings of Commoner (1969), Dubos (1966), Leopold (1948), Nicholson (1970), Schoenfeld (1970), and White (1967).

Many attempts have been made to overcome the general disdain for nurture of a quality environment. Education, in particular, has been recognized as a potentially potent force for developing environmentally responsible behaviors. Throughout the one hundred and seven years which span the statements by Marsh and Commoner the schools made several attempts to demonstrate the critical importance of the man-land interactions and develop a set of behaviors which would enhance environmental quality. These goals were part of Object Teaching, W. L. Jackman's elementary science program (1891), nature study (at the turn of the century), the Cornell Nature Study Program ala Bailey, and more recently outdoor education and conservation education. Each response, whether a new method of teaching a subject, a philosophy delineated in an educational yearbook, or development of a curriculum, reflected a degree of societal response to environmental problems and had some momentary influence on the school curriculum.

All the above efforts dealt with some aspect of man's interaction with the environment. But from today's vantage point everyone missed the "big picture" because of the lack of recognition of the complexity of this interaction. Or, if the complexity was recognized, the subsequent programmatic thrust was inadequate to communicate the resultant message to the consumer.

The fact that there were no environmentally oriented individuals or groups in power positions in national politics also tended to dilute the effects of these predecessors of environmental education. And consideration of environmental problems as societal problems of an adult public fostered educational programs of the short term--put out the fire--variety. Emphasis was placed on quicker corrective measures rather than investing long-range risk capital in the schooling of elementary and secondary school youngsters who could develop behaviors which would prevent the problems from developing in the first place.

Not until recently did Marsh's hundred year old message sink in: Man is a part of nature. With this realization came environmental education, a new strategy to deal with the totality of man-land interactions, a strategy sufficiently comprehensive to include forerunners such as nature study, outdoor education, and conservation education, but doing so in a way that broadens the strengths of each into a broader, more comprehensive perspective.

Many have attempted to define today's environmental education and describe its characteristics. A recent and adequate definition capturing the strengths of the better previous formulations was proposed by the U.S. Office of Education.

> Environmental education is the process that fosters greater understanding of society's environmental problems and also the processes of environmental problem-solving and decision-making. This is accomplished by teaching the ecological relationships and principles that underlie these problems and showing the nature of the possible alternative approaches and solutions. (U.S. Office of Education, 1973)

Generally agreed upon characteristics of environmental education have also been collected in an Office of Education document (1971).

1. a multidisciplinary approach, with an emphasis on the interrelationships of man and nature.

2. a focus on contemporary problems relating to the urban and rural environment--manmade and natural.

3. incorporation of nonformal as well as formal education processes and utilization of resources outside the classroom.

4. development of understanding and attitudes as well as information.

5. involvement of all age groups

6. a participant-centered design, involving each learner in choosing priorities both as to the issues to be studied and the solutions that seem most appropriate.

The substance of this definition and the associated characteristics indicate that the long-range goal of environmental education is to help present and future members of society develop a concern for the environment and acquire expertise in making decisions which affect quality of man's supportive environment. In addition to acquiring those behaviors which are environmentally responsive and responsible--committed to minimizing environmental degradation, one needs to develop decision-making skills where both cognitive and affective input are part of the process. And, particularly, to learn that both cognitive and affective input will affect the nature of the decisions and how they are made.

The importance and complexity of environmental decision-making was stressed by the President's Council on Environmental Quality (1970). Their report indicated that environmental decisions are extremely complex and are not based solely on knowledge of the earth's life support systems. Environmental decisions are invariably influenced also by economic and political factors, social pressures, and cultural values.

Unfortunately, the various facets of environmental decision making are so complex they are not well understood. This is demonstrated over and over again in the scholarly literature. Craik (1969) considers such decisions as resting upon underlying attitudes, values and beliefs. And, according to psychologists such as White (1966), Cohen (1964), Krech, Crutchfield,and Ballachey (1962), and Rokeach (1970, 1971), attitudes, values and beliefs are distinctly different psychological concepts. Absence of precise distinctions and understandings of the interactions among these concepts and between affective and cognitive domains in the realm of environmental decision-making further compound the problem. In fact, as Krathwohl, Bloom, and Masia (1964) point out, much research clearly demonstrates that affective and cognitive domains can never be completely separated. While psychological researchers such as Fishbein (1963), Rokeach (1968, 1971) and McKechnie (1969) continue to explicate and measure the "distinctive" members of the affective domain, because of definitional problems this "reductionist" approach may not have maximum utility in environmental education,considering its current stage of development.

Central to environmental education's philosophical foundation is an interdisciplinary, holistic approach to environmental problems and environmental decision-making. Certainly attitudes, values, knowledge, and beliefs influence an environmental decision (behavior). But EE's focus remains on the overall

process. Thus, it appears that a global rather than a piecemeal approach to the study of environmental decision-making would be more in keeping with EE's philosophical underpinnings. Such an approach would first examine a person's ENVIRONMENTAL ORIENTATIONS, the responses he gives regarding various aspects of his environment. These ENVIRONMENTAL ORIENTATIONS could approximate environmental decisions. They would reflect the decisions a person makes regarding his various environments. Such ENVIRONMENTAL ORIENTATIONS, while subject to all the inherent limitations of self-reports should reflect the entire "bag" of cognitive and affective inputs involved in making such decisions.

By coining the term, ENVIRONMENTAL ORIENTATIONS, a more global "intergrationist" view of decision-making is implied. Pursuing an understanding of this comprehensive orientation becomes the central thrust of this study. An indication of how environmental orientations are defined and how they are related precedes a statement of the problem.

Based on the previously discussed conceptual framework, an a priori definition for ENVIRONMENTAL ORIENTATIONS would be:

> ENVIRONMENTAL ORIENTATIONS--expressed responses of individuals to both general and specific areas of their environments. These EOs reflect both cognitive and affective inputs and the interactions involved in making environmental decisions.

The "universe" of ENVIRONMENTAL ORIENTATIONS is illustrated in Figure 1. ENVIRONMENTAL ORIENTATIONS may be toward something as broad as "the world" or toward something more specific, such as the preferred solution for a local air pollution problem. From this universe, three areas of potential utility to environmental educators are:

A. ENVIRONMENTAL ORIENTATIONS toward the present and future (the general feelings individuals have towards their world, and their feelings toward what the future might hold.)

B. ENVIRONMENTAL ORIENTATIONS toward pollution and the environment. (focusing on the orientations an individual possesses toward general and specific aspects of the environment and pollution.)

C. ENVIRONMENTAL ORIENTATIONS towards specific environmental problems. (focusing on the solutions an individual prefers to specific problems, and his action-orientation towards solving problems.)

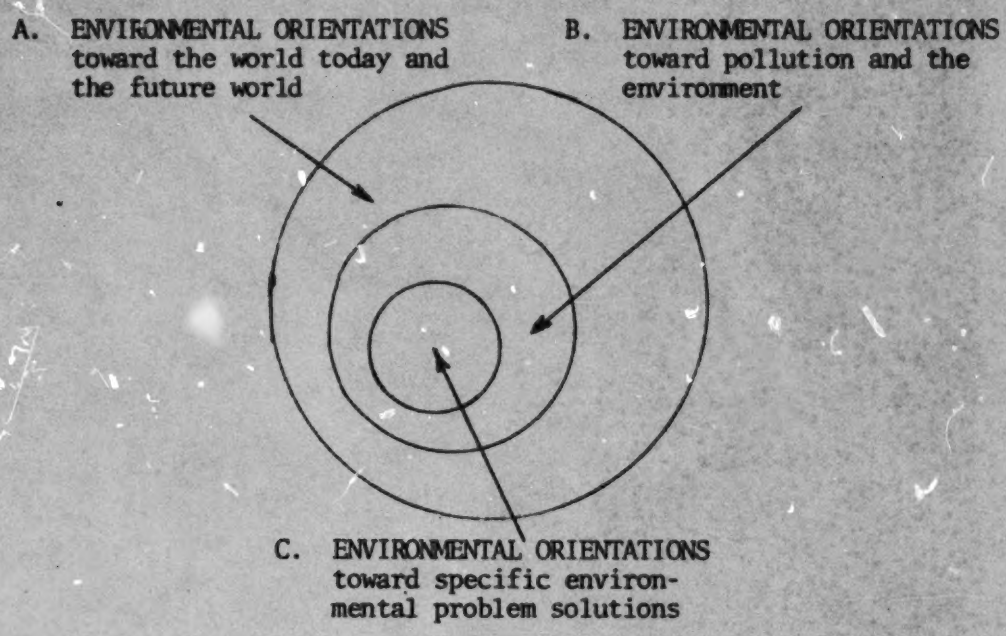
A. ENVIRONMENTAL ORIENTATIONS toward the world today and the future world
B. ENVIRONMENTAL ORIENTATIONS toward pollution and the environment
C. ENVIRONMENTAL ORIENTATIONS toward specific environmental problem solutions

Figure 1. The Universe of ENVIRONMENTAL ORIENTATIONS

Ways to measure these ENVIRONMENTAL ORIENTIONS would be of enormous value to environmental educators in planning and evaluating several EE activities. Results would also aid in generating new knowledge about environmental decision-making. The study of such EOs would be extremely appropriate at elementary school levels, where the EOs, presumably, are in the formative stages and are in a greater state of flux.

The Problem

It was the purpose of this study to develop instrumentation for use in acquiring an understanding of elementary and middle school aged children's environmental orientations.

CHAPTER II

RELATED RESEARCH

The literature review was designed to identify studies which would help clarify the nature of environmental orientations and indicate what factors, such as conceptual knowledge, attitudes, beliefs, chronological age, etc., might influence environmental orientations. Because of the way an environmental orientation was defined the number of pertinent studies was limited. Partially because most researchers have employed the "reductionist" approach to environmental orientations or environmental decision-making. These reductionist studies do not deal with the "big picture" of man-land interactions. However, certain reductionist studies provided useful clues for instrument design and identification of variables such as age or community which should be considered when preparing and refining these instruments.

Needed Research

Roth (1970) and Ronfeldt (1969) developed lists of major environmental education ideas considered important for inclusion in the school curriculum; attempts to identify what an individual should know. The major ideas included in these lists illustrate the importance of including interactions of cognitive and affective inputs when studying the environmental decision-making process. These studies lend credibility to the postulation that an environmental orientation is a reflection of a complex interaction between the cognitive and affective states of the individual. Instrumentation to measure the nature of these orientations is lacking.

Further support for developing instrumentation of this nature comes from a survey conducted by the NEA Research Division (1970). The results revealed that school administrators were seeking research and evaluation assistance in conjunction with environmental education programs, particularly the affective dimension. In addition, reviews of work in outdoor education and conservation education by Gillenwater (1969) and Donaldson (1972) demonstrated the need for increased research effort centering on environmental interests and attitudes. Abram and Rosinger (1972) also stressed the limited amount and quality of research in general affective areas. In particular, they stated, research with school age children is particularly in short supply.

Knapp (1972) indicated that part of this deficiency was that the application of affective research findings to environmental education is still in its infancy. Roth and Helgeson (1972) and Gallagher (1972) reviewed research in environmental education and

science education. They called for more research in the area of instrument development and program evaluation concerned with the attitudes and affective states of school children. This deficiency was also noted by Voelker and Watson (1973) in their review of studies pertaining to environmental education.

The above discussion illustrates the magnitude of concern for increasing the amount of affective-oriented research in environmental education. It also provides evidence of scholarly support for conducting such research and acknowledges the role that instrument development must play in the research and evaluation effort associated with areas dependent on input from both the cognitive and the affective domains. These studies and reviews urge that attempts be made and sustained to develop instruments for measuring environmental orientations.

Surveys

The results of several public opinion polls (Chaney, 1970; Hine and Gerlock, 1970; Barnett, 1970) provide clues to environmental problems of concern to the public. Chaney's work (a Gallup poll) showed that more than 85% of the respondents were concerned about the present state of the environment. The order of rankings, based on percentage of response, for specific problems was: air pollution, 36%; water pollution, 32%; pesticides, 7%; preservation of open space, 6%; wildlife preservation, 5%; and soil erosion, 4%. The responses from over 7,000 readers completing the Hine and Gerlock questionnaire in National History magazine demonstrated heavy acceptance of population control to maintain a good "quality of life". Approximately 80% of the respondents felt that all families should limit the number of children and a plurality (62%) of the sample felt a personal responsibility for pollution.

Results of these studies suggest some of the problem areas to consider in developing instrumentation to measure environmental orientations. Such instrumentation could be employed to seek out the sources of differences in peoples environmental orientations. These topics do not constitute the total set of environmental orientations but they do provide a research base for beginning.

Community Orientations

Studies in this category reflect the "environmental orientations" of people from specific communities. In some instances the variability in orientations is shown to be associated with selected independent variables. Studies discussed were conducted by Constantini and Hanf, 1972; DeGroot, 1966; Medalia and Finkner, 1965; Perry, 1972; Rankin, 1969, Stamm and Bowes, 1972; and Tognacci, et. al., 1972.

Tognacci and his colleagues prepared an instrument with seven different scales: two measures of general environmental goals (importance of and attainment of a pure environment) and five specific Likert scales on conservation, pollution, power plant pollution, overpopulation, and individual population control. These were administered to 141 residents of Boulder, Colorado. Results indicated that the degree of concern for ecological issues as measured on each of the scales appears negatively related to age and positively related to both socio-economic status and education. No sex differences were found on any measure. On the basis of this work Tognacci postulated this profile of an environmentalist.

> The environmentally-concerned individual tends to be more liberal in socio-political orientation, younger and better-educated than persons who remain less concerned about ecological issues. Our results also provide tentative conclusions that SES may be directly associated with environmentalism. (83, 85)

Constantini and Hanf concluded that persons with "high" environmental concern are better educated and differ across a wide array of attitudes and perceptions of environmental issues in their specific locality (Lake Tahoe). In general, the high concern group was more appreciative of asthetic and rural values and critical of technologies role in society than their low concerned counterparts. This study in comparison to several others exhibited a less "reductionist" approach. From it emerged a more global picture of the "environmental orientations" of the decision makers in Lake Tahoe.

DeGroot reviewed six earlier studies, where affective measures were used to probe public response to air pollution, and concluded that variables such as age, sex, race, and SES are poor predictors of concern about air pollution. He argued that the overriding determinant for environmental concern was the atmospheric quality of the individuals immediate environment.

The studies cited in this category all focused on factors that might influence an individual's environmental orientation. Of note are the seemingly contradictory results. The diversity might be attributed to the fact that the studies were conducted in different locales with different populations and that they had slightly different purposes. In any event the studies indicate that education is a major factor in producing a more positive environmental concern. They provide additional support for conducting research with school age children regarding their environmental orientations and identifying factors which could influence their environmental decision making.

Studies with School Age Children

Only five studies conducted with elementary school children have pertinence to this discussion. Results of these studies show the potential of "environmental orientation" research at the elementary and middle school levels.

Mitchell and Lunneborg (1973) reported an evaluation of a year long environmental education program designed for use with a group of rural first graders. Their interviews and related parent questionnaire were used to assess change in perceptual skills, values, knowledge and behaviors. Findings showed significant group differences in favor of the experimental group for changes in values and perceptual skills but not for knowledge.

Trexler (1963) studied the relationship between urban sixth graders classroom statements of conservation behavior and actual conservation behavior, and the relationships between these and the independent variables of I.Q., sex, academic achievement and type of residence. There was little correlation between student's stated intentions and actions. Consistency of statements and actions did not vary significantly with any of the independent variables.

Donnelly (1957) administered a 20-item knowledge questionnaire including items on state of balance in nature, beauty, maintaining a safe and healthful environment, wide use of natural resources, and interrelationships in nature to a group of 282 urban sixth grade children in New York City. Results indicated that intelligence was highly correlated with test scores and that higher scorers were generally more optimistic about their environment than lower scorers. Donnelly speculated that

> Children who are deprived of certain learning experiences - those who must spend summers in the city and those who read little -- learn to accept the circumstances and do not have the information required for anticipating wholesome conservation experiences and practices. (120)

Developing instruments to measure environmental orientations could provide a means for obtaining information about the degree of children's optimism for their world, present and future. These environmental orientations should reflect environmental knowledge and feelings.

Research conducted by Towler and Swan (1972) also gave some insight into elementary school children's thinking about the environment. A thirty item questionnaire concerning air, water and solid waste pollution was administered to 204 fourth, fifth and sixth graders in two communities in Northern Indiana and

Central Florida. The students surveyed ranked air pollution as the number one problem among the three listed but the children's degree of environmental knowledge was judged poor. For example, the children tended to have little idea how they personally contributed to air pollution. Other conclusions were that students were very aware of environmental deterioration and pessimistic about the future.

The Burchett (1971) study provides some clues for designing instruments to use in measuring environmental orientations, in terms of degree of optimism or pessimism toward the present and future world.

Studies reviewed here indicated that (1) measurable changes do occur across some factors which influence environmental orientations, (2) children exhibit varying degrees of optimism or pessimism and knowledge concerning environmental practices, and (3) what children say and do are not necessarily consistent. Wicker's (1969) review of research on the relationship between attitudes and behaviors supports this latter generalization.

Other related studies have been conducted with student populations other than elementary school children. Viedermann (1973) surveyed nationally 700 high school students regarding their knowledge of population issues. Results indicated that student knowledge was low in every area--facts, trends, and relationships. Swan (1967) found low SES high school seniors (living in inner city areas) significantly less aware of air pollution than those of high SES. He also found that visual awareness of smog alone does not appear to motivate concern for alleviating air pollution.

Steiner (1971) produced a series of Likert items. He termed the 7 interpretable factors an inventory of societal issues. No significant differences were found among a group of high school seniors when classified according to the amount of science taken in high school, sex, or school environment. George (1966) studied the conservation attitudes of groups of high school students, college students, and adults. He found that conservation attitudes increased positively from high school through college to adults. Age, sex, and education were associated with most significant differences among the high school students attitudes. Possession of knowledge was also positively related to favorable attitude.

In addition to these studies other environmental "attitude" research studies have dealt with teachers (Sherman, 1950; Laug, 1960); graduate students (Bart, 1972); college science versus non-science teachers (Hoover and Schutz, 1963); and attitude changes based on school camping experiences (Stack, 1960; Davidson, 1965; Rupff, 1957). These studies provide conflicting evidence as to the influence of variables such as sex or age in discriminating between levels of environmental concern. This may

be due to the limited focus of a particular study and possibly to the reductionist slant that most of these studies take. In any event, it is necessary to develop instrumentation which is sufficiently comprehensive in what it measures that one can more carefully discern whether and when in fact variables such as sex, SES, etc., are consistent indicators of the nature of peoples environmental orientations.

Psychological Studies

Psychological research on behavior and environmental perceptions also has the implications for research on environmental orientations. McKechnie (1969) developed an environment response inventory where individuals indicate whether the substance of each item is typical of their views and behavior. Factor analysis was used to identify various response types which have been explicated in terms of psychological responses. The resulting three scales were labelled as urbanism, environmental well being and pastoralism. The fact that there are categories of responses has direct implication for this study. Instruments need to be developed which will elicit patterns in the responses of elementary and middle school children. These can be identified and subsequently used to make comparisons as a function of independent variables.

Other studies involving elementary school children's environmental perceptions were conducted by Ladd (1970) and Maurer and Baxter (1972). The respondents were asked to draw out maps of their local communities. Findings included the following: certain elements in the maps varied along the age dimension. Elementary school children were interested in TV, windows, garages, sky, cars, blacks, hotels, smog, traffic, etc. Significant ethnic differences occurred in the percentage of map devoted to the home. Black children drew homes which occupied 25.1% of their neighborhood map, while Mexican-American children assigned about 5.1% of their maps to home designation. The similar characteristic percentage for Anglos was only 2.5%. No sex or age differences were evident.

Other Studies

Several studies have focused on sex differences as they pertain to the designation of attitudes and achievement. Terman and Tyler (1954) found that boys excelled in science, history, geography and math while girls excelled in English, spelling, writing and art. Perrodin (1966) noted that boys have a greater interest in physical science than do girls. Rowland (1968) attributes this to the fact that boys bring a richer background in science related experiences than do girls.

Shrigley (1972) reported a significantly more positive attitude toward science on the part of sixth grade boys compared to sixth grade girls. However, he found no significant difference in their knowledge of the content of science. In a study of political attitudes Hess and Torney (1967) found evidence of relationship between children's attitudes and specific characteristics of people. For the 17,000 elementary school children included the researchers found that as children grow older attitude changes occur, with a large degree of political learning and experience occurring at the pre-high school level and the greatest change in attitudes occurring in fourth and fifth grades. Boys acquired attitudes more rapidly than girls and children from low SES were less affected by schools than children from more prosperous areas.

The results of these studies indicate that grade level as an estimate of maturation, chronological age, sex, and socio-economic status should be considered in the earliest stages of instrument development for use in doing research related to environmental orientations.

Summary

This research review indicates that the integrationist view of environmental education--the complex interaction of input from both the affective and cognitive domains--has not been adequately conceptualized or researched. In general, the existing studies have been conducted largely from a reductionist perspective, looking at isolated pieces of a person's orientation towards his environments. There is a need to develop instruments derived from this broader conceptual base. This is prerequisite to conducting research.

The results of the review also demonstrate that many factors are potential influences on the nature and nurture of environmental orientations. Instruments prepared must be consistent with the totality of man-land interactions. But equally as important is to use a data base for evolving items and deciding how to assemble these items. Ideas must be obtained from the respective target population before and during item development. In terms of elementary and middle school aged youngsters, consideration should be given to a span of grade levels, sex, community location, SES, and intelligence.

By developing instruments derived from simultaneous consideration of conceptual framework and a data base, the status of environmental orientations can be assessed and the influence of selected variables on growth and changes in these orientations can be studied. With this information available appropriate judgments can be made as to the status of various publics environmental orientations and the effect of various educational programs on changing those orientations in favor of a quality environment.

CHAPTER III

INSTRUMENT DEVELOPMENT AND PILOT TESTING

Modification of existing affective measurement techniques was considered appropriate in developing instruments to measure environmental orientations. A battery of paper-and-pencil instruments was prepared. Responses to general and specific aspects of an individual's environment, elicited by these instruments, became ENVIRONMENTAL ORIENTATIONS.

Paper and Pencil Instruments

Cost, ease of administration and the sophistication possible in design, as well as amenability to statistical treatment are just a few of the advantages of paper-and-pencil testing. But there are also disadvantages. Steps taken to alleviate some of these short-comings follow.

A. Lack of motivation for respondents. If the test doesn't seem related to the respondents "real world," little thought or effort may be exerted in completing the task. One person administered all instruments in the battery. The introduction used (Appendix A) in the pilot and field work attempted to make the tests relevant to student concerns. No overt manifestations of "lack of motivation" were observed throughout pilot and field testing.

B. Paper-and-pencil instruments may "stack the deck" in favor of students possessing reading and writing skills. This disadvantage was minimized by:

a. utilizing a series of 56 semi-structured interviews (subjects chosen randomly from the total pilot group) to elicit children's verbal responses to environmental problem stories as well as their written responses. The interviews provided insight into how children view various environmental problems, and what comprehension or reading problems might be present.

b. maintaining the reading difficulty of the battery at the lowest level consistent with the material to be included, and the target population. Analysis of five selections, randomly chosen, from the instrument containing ten stories about specific environmental problems, indicated an average reading level of 3.2,

with a range of 3.0 to 4.0. (Fry Readability Formula, 1968).* The battery posed few, if any, reading problems to grade 8 students. Grade 5 students reading substantially below their grade level were aided by classroom teachers, if necessary. Enough time was provided so that "slow" readers were not rushed. Good readers did not appear to be bored.

c. reading written instructions to all students aloud, while they read the instructions to themselves. The techniques used in marking answers on each instrument were thoroughly discussed. Questions were encouraged. Students' written comments, elicited at the end of the pilot test form, indicated they felt the instructions were clear, and the tests "easy to do".

d. requiring a minimum of writing on the final instruments. Subjects checked boxes or circled items to indicate their ideas. This made the tests more attractive to those students who dislike writing. The format also reduced testing time.

e. including pictures in one instrument of the battery to stimulate interest in the situation illustrated, and to provide alternate, non-written information about the story.

C. The "Hawthorne or guinea-pig effect." Much research has indicated that interactive effects can occur when subjects are aware of a "special situation." For example, subjects may try to give answers they think are wanted (to "help out" the researcher), or try to guess the researcher's "real" purpose. Both of these situations can bias obtained results.** While it was impossible to completely compensate for this factor (i.e., students knew this was not something their teachers did everyday), the investigator encouraged students to write whatever they thought. "Your own" ideas and opinions were stressed during pilot and field testing of all instruments. In addition, the investigator attempted to present a logical reason for his interest in student ideas. The use of the term "environmental" was avoided in all introductions and titles of instruments. While most students quickly discovered the emphasis of the battery, creating a "mindset" was avoided to deter the individual from slanting answers to show that he was very "environmentally-responsible."

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*Grade levels obtained using the Fry formula correlate highly with grade levels calculated on the Dale-Chall (.94) and Flesh (.96) formulas (Fry, 1968).

**However, Webb et.al. (1966) maintain this is more an issue in psychological than in educational research.

Affective Measurement

Major assumptions are made whenever utilizing paper-and-pencil instruments such as the ENVIRONMENTAL ORIENTATIONS Inventory:

1. Subjective attitudes can be measured quantitatively. While there is disagreement among experts on the validity of this assumption, as Selltiz et.al. (1959) states, "pragmatically, scores...often provide the basis for a rough ordering of people on the characteristic being measured." (pp. 368-369)

2. Each test item has the same meaning for everyone. This assumption is, of course, impossible to completely defend because of semantic problems always encountered when using one instrument with any heterogeneous group of people. However, pilot test procedures were designed to help produce test items with as few semantic difficulties as possible for students in fifth and eighth grades.

Thus, in developing the three instruments which comprise the EO Inventory, sustained attempts were made to overcome the inherent limitations of paper-and-pencil instruments, and meet the assumptions underlying affective measurement. Reliability and validity were also considered. No matter how "good" the statistics, interesting the results, or motivated the students, if the instruments do not undergo appropriate validity and reliability determinations, no confidence can be placed in the information obtained.

Detailed discussions of the procedures used to determine validity and reliability of the respective instruments are included in the appropriate sections of this report. However, the concepts of reliability and validity and the general procedures used to establish them are briefly outlined here.

Reliability

All measurements of human performance are more or less variable from one occasion to another. Reliability involves the idea of consistency--how consistently a test measures whatever it measures.* According to Harris (1968), placing individuals along a scale by an unreliable measure is equivalent to random placement. An unreliable measure has no value.

There are several approaches to estimating reliability of an instrument. Because of the nature of an EO, two estimates of reliability were used: an estimate of internal consistency and an estimate of stability. Internal consistency provides evidence

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* This concept of reliability is discussed by many, including Edwards (1957), Gulliksen (1950), Lord and Novick (1968) and Thorndike (1951).

of the ability of items to measure an underlying EO, while stability estimates how stable the EOs are for the target group.

Edwards (1970) described the relationship between internal consistency and stability estimates:

> If the internal consistency estimate is high, then the test/retest coefficient will also tend to be high, with the internal consistency estimate being a lower bound estimate of the stability coefficient. If, however, internal consistency is high, and test/retest is low, this indicates the trait measured is not relatively stable over the time interval between the two testings. (p. 24)

A low internal consistency value provides evidence that, in general, responses to items in a scale are relatively independent or uncorrelated. Scales which have a high degree of internal consistency are scales where item responses tend to be positively intercorrelated from which it is reasoned that, in general, the items are measuring some common trait.

Hoyt reliability estimates of internal consistency were used for this work. This coefficient represents an improvement over the still-used but outmoded split-halves correlation (Spearman-Brown). According to Hoyt (1941), the estimate is better than that obtained by dividing the test into odd and even halves because the particular split of the test--only one of many ways results in either overestimating or under-estimating the reliability coefficient.

Reliability estimates using the Hoyt formulation are comparable to other common formulas. As Harris (1968) stated:

> Kuder-Richardson formula 20 (KR 20), the Hoyt reliability and Cronbach's coefficient alpha (1951) are all algebraically equivalent, i.e., no matter what formula one uses for a given set of data, the numerical estimate of the reliability will be the same. (p. 17)

Stability

The test/retest correlation used to estimate stability was obtained by correlating the scores on two separate administrations of the same instrument using the Pearson product-moment correlation (Isaac and Michael, 1970). The primary utility of this coefficient was to estimate stability of responses over time. No matter how internally consistent responses on the various instruments of the EOI might be, if EOs measured today don't resemble EOs measured tomorrow, then the concept of ENVIRONMENTAL ORIENTATIONS has little practical value for either EE program development, evaluation, or research.

In measuring stability, the investigator is faced with a Gordian knot: how long should the time period between test administrations be? If the period is too short, students will remember previous responses and spuriously high stability estimates will result. If the period is too long, effects of history and maturation (Campbell and Stanley, 1966) could change responses so spuriously low stability estimates result. As there are no hard and fast rules in choosing a time period, a middle ground was chosen to minimize either possibility. Periods from 4 to 7 days were employed for retests on all instruments--long enough to forestall immediate memory effects, while short enough to lessen possible interventions.

A correlation greater than or equal to .50 (Thorndike, 1951) was considered acceptable for the stability and internal consistency estimates. This is an arbitrary cut-off point, but it appears to be a generally accepted minimum reliability for a test used with groups.

Validity

Simply stated, validity asks if a test is measuring what it is purported to measure. Several types of validity assessments are possible, including a coefficient representing the correlation of the test scores with some criterion (criterion-referenced validity) and subjective judgments of "experts" regarding the relevance of a test (content validity).*

Content validity was employed here. Panels of judges validated items and stories used in the instruments. (Procedures and criteria used by panel members are included with discussion for each instrument.) The panel members representing a wide range of perspectives on environmental education, gave their collective judgments on each item or story. As Wood (1960) put it, "the necessity for human judgment at some point is inescapable for any type of validity." (p. 18)

General Procedures for Instrument Development

The range of ENVIRONMENTAL ORIENTATIONS of interest, from a general orientation towards the present and future, to orientations toward specific environmental problems necessitated developing three different types of data-gathering instruments. Each instrument in the resulting Environmental Orientation Inventory (EOI) tapped a different aspect of an individual's ENVIRONMENTAL

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* For a discussion of validity procedures, see Technical Recommendations for Psychological Tests and Diagnostic Techniques, American Psychological Association, 1954.

ORIENTATIONS. These included a semantic differential, a Likert agree-disagree scale and a third instrument entitled the Environmental Decision Inventory (EDI) which employed multiple response formats. The general ENVIRONMENTAL ORIENTATIONS ("Our World of Today" and "Our World of Tomorrow") were measured by the semantic differential. The Likert scale measured more specific EOs towards general environmental problems. The Environmental Decision Inventory was designed to elicit the most specific orientations--to actual environmental problems.

The semantic differential consisted of two independent scales. These scales were prepared to obtain an estimate of the relative degree of the individual's optimism or pessimism about both his present and future world or environment. Items for the Likert scale and stories for the Environmental Decision Inventory focused on environmental problems perceived by professionals as the paramount problems facing the world. However, problems selected had to be pertinent to the child's experience and be the kinds of problems that confront him on a daily basis. They had to be problems the child might comprehend. Direct information from many children and teachers, and examination of instructional materials and media messages that children encounter, helped insure that the problems would be meaningful problems from the child's perspective. The most serious environmental problems, as compiled by 18 internationally-known environmentalists and ecologists at the United Nations Conference in Stockholm, Sweden (June, 1972) served as a guide in selecting these problems. (Appendix B).

I. Semantic Differential (OUR WORLD OF TODAY/TOMORROW):

According to Kerlinger (1965) the semantic differential is a method of observing and measuring the psychological meaning of things, usually concepts. The technique allows a respondent to express himself along a continuum on several sets of bi-polar adjectives describing a central concept. Osgood, Suci and Tannenbaum (1957) characterized the differential as essentially a combination of controlled association and scaling procedures. They considered it a general way to get at a certain type of information, adaptable to the requirements of the specific research problem. There are no standard concepts or scales. The differential is most useful for objects or events which can be described with a minimum of descriptors. It was used here to determine ENVIRONMENTAL ORIENTATIONS toward the present ("Our World of Today") and the future ("Our World of Tomorrow").

Osgood, et. al. (1957), Nunnally (1961) and others have used factor analysis to identify a number of dimensions or factors that semantic differential adjective-pair descriptors cluster around. The most important factor includes adjectives that are

[SEE ERRATA PAGE 3]

Table 1

Initial Word-Pairs for Pilot Version

"Our World of Today/Tomorrow"

good--bad*	beautiful--ugly
like--dislike	happy--sad
neat--littered*	pure--polluted
crowded--roomy	sweet-smelling--stinking*
valuable--worthless, cheap	sunny--hazy*
bright--gloomy	clean--dirty*
healthful--sickening*	pleasant--unpleasant*
pretty--ugly*	nice--awful*
perfect--imperfect	safe--dangerous*

*retained on final instrument

The initial set of 18 word-pairs employed on the pilot version of the semantic differential came from Burchett's study (1971), Table 1. She reported the adjectives meaningful to a group of children in grades 4, 5, and 6. Directions for the Burchett instrument were substantially revised and included more examples of how to mark the word-pairs.

Standard semantic differential procedures, including random assignment of word-pairs and word positions, were followed (Osgood, et. al., 1957; Kerlinger, 1965). A five position response format was chosen for this instrument, deemed appropriate for children in grades 5 and 8.

The Semantic Differential Pilot

The pilot instrument was administered to groups of children in two communities, 99 students in a semi-rural community near a metropolitan city and 103 students in a city-urban community of semi-industrial character, during March and April, 1973. The sample was about equally divided between grades 5 and 8 and boys

*Permission granted, letter dated 5/11/73.

and girls. Administration time (including giving instructions) for this version was less than ten minutes. Eighth grade students required less time than fifth grade students.

Scoring the differential was accomplished by assigning a weight of five to the positive (optimistic) pole for each adjective pair and a weight of one to the negative (pessimistic) pole. Intermediate positions were weighted proportionally. Total scores on the two scales were calculated by adding the weights assigned to each item response. The higher the score, the more optimistic the person was toward the present or future world.

The internal consistencies (Hoyt reliabilities) reported in Table 2 were uniformly high for fifth and eighth graders in both rural and urban sub-groups. The range of reliabilities reported for "Our World of Today" was .87 to .93; for "Our World of Tomorrow" even higher, .94 to .99. Such high reliabilities reflected a high intercorrelation among items, and provided support for existence of an underlying ENVIRONMENTAL ORIENTATION (in terms of optimism/pessimism) towards the present and the future.

Retest Procedures

Retest procedures to estimate stability were identical for all three instruments in the battery, and thus, are described only here. At the time of initial testing, students were not informed that there would be a retest. Teachers were instructed to avoid divulging this information. On the day of the retest, a standard explanation based on an interest in whether people change their minds was offered to the students. Students were encouraged to respond according to how they felt that day, regardless of whether or not it was in agreement with what they said previously. The exact explanation is in Appendix C.

Not all students were retested for practical considerations of time and disruption of classroom schedules. Stability estimates were usually obtained with a group of students randomly chosen from the total group taking a particular instrument.

The stability estimates obtained on this test-retest ranged from .75 to .92 (see Table 3). These estimates were lower than the corresponding Hoyt reliabilities for each group tested. Edwards (1970) suggested that the Hoyt estimate of internal consistency is a lower bound for the stability coefficient, but this was not the case here. The internal consistency of the semantic differential for these groups was very near the upper limit for reliability coefficients (1.00); thus, variation in scores on this instrument over time (an unavoidable variation in any human-oriented research) is unlikely to be small enough that the stability estimate would be greater than or equal to such high Hoyt values. In any event, these test/retest values exceeded

Table 2

Means, Standard Deviations,

Hoyt Reliabilities, and Sample Sizes

Pilot Test

"Our World of Today"

	Grade	$\bar{X}$	σ	r	N
Urban Students	5	61.6	11.8	.89	55
	8	55.0	11.8	.93	48
	5 & 8	58.5	12.2	.91	103
Rural Students	5	58.1	11.2	.87	45
	8	52.5	10.9	.91	54
	5 & 8	55.1	11.3	.90	99
Totals		56.8	11.8	.91	202

"Our World of Tomorrow"

	Grade	$\bar{X}$	σ	r	N
Urban Students	5	67.7	15.5	.94	55
	8	53.7	21.6	.99	48
	5 & 8	61.2	19.8	.97	103
Rural Students	5	66.8	19.4	.97	45
	8	46.0	21.0	.98	54
	5 & 8	55.5	22.7	.98	99
Totals		58.3	21.4	.98	202

Table 3

Means, Standard Deviations, Test/Retest

Correlations, and Sample Sizes

Pilot Test

"Our World of Today"

Community	Grade	$\bar{X}$	σ_x	$\bar{Y}$	σ_y	r	N	Time (days)
Urban*	5	61.8	12.4	62.7	14.7	.87	25	6
	8	55.4	13.1	53.7	12.1	.86	25	6
Rural	5**							
	8	52.5	10.9	49.7	11.8	.75	27	5

"Our World of Tomorrow"

Community	Grade	$\bar{X}$	σ_x	$\bar{Y}$	σ_y	r	N	Time (days)
Urban*	5	65.3	17.1	67.4	18.7	.81	25	6
	8	48.2	20.7	48.6	22.2	.88	25	6
Rural	5**							
	8	47.2	22.4	49.3	23.6	.92	27	5

* Students randomly selected from total group.

** Note: Rural fifth grade student identifications on the retest were unavailable. However, t-tests for differences existing between the mean group scores on the test and retest were below the necessary values for significance (α=.05) for both the "World of Today" and "Tomorrow".

the lower reliability limit set for this work. The childrens' orientations towards the present and future appear fairly stable over the time period (5 to 6 days) investigated.

Factor Analysis of Pilot

A final check of the functioning of these scales involved a principal components factor analysis, Varimax rotation. If the scales were functioning homogeneously (i.e., if all the word-pairs were basically evaluative), one factor, accounting for a large proportion of the variance, would be evident. This would correspond to the evaluative dimension. As Chafee et al. (1969) indicated:

> Generally, we would hypothesize that there is but one evaluative component common to all attributes, and this factor should account for most of the variance in use of semantic differential scales... This is consistent with Osgood's main findings, and with our theoretical idea that the main affective response a person can give for an object represents its total utility for him. And that, after all, is what an opinion researcher usually wants to determine. (pp. 667, 673)

The results of the factor analysis partially supported Chafee's contention. Responses on "Our World of Tomorrow" were unifactorial, with the one factor accounting for 73% of the total variance.* However, responses on "Our World of Today" grouped into three factors, accounting for 24%, 17%, and 12% of the total variance respectively. No attempt was made to characterize the factors at that point. According to Harman (1967), this sample size (202 students) is at the lower limit of utility for a factoring procedure on an 18 item test. Another estimate of the homogeneity of the test would be obtained in conjunction with the field test.

Revision of the Instrument

At this point, shortening the test form was investigated. Pilot information indicated that an 18 word-pair test was not too long for children in the target groups, but the high reliabilities indicated that dropping some word pairs would not appreciably decrease test reliability. Since this test would be one part of a battery with substantial time requirements for administration, it would be advantageous to reduce the instrument to minimum

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*The cut-off point for factoring in the computer program utilized (FACTOR2, Statjob Program Manual, Madison Academic Computing Center, UW--Madison) was an eigenvalue of 1.0; Factors with values less than 1.0 were not produced.

acceptable length. The Spearman-Brown formula for estimating the reliability of a shortened test (Cronbach, 1960) indicated that the reliability of a 10 item test would be about .85; more than adequate and much higher than usual for this type instrument.

Several criteria were used to select the ten word-pairs for the final instrument. They included the following:

1. The word-pair should possess good scalability characteristics. The RAVE sub-routine of the FORTAP (Baker, 1969) test analysis program was utilized to estimate item scalabilities.* This routine takes weights assigned to each response and by an iterative process converges to a new weighting scheme to maximize the internal reliability of the instrument. Printout includes revised weights and number of respondents in each category. According to Baker (1969), if the items in the instrument do, in fact, measure a single underlying variable and are scalable, the reliability coefficient printed after each iteration should increase in value.** An item which bears no relationship to the objectives of the instrument will receive equal weights for all its responses. Items whose responses differentiate between high and low scoring persons will receive a large range of values, with the range directly proportional to the degree of discrimination of the item responses. Thus, a good item, on this criterion, would (1) have a sufficient number of people (generally 5% of the sample) choosing each response for an item and (2) possess a wide range of RAVE weights (indicating discrimination) with no weights repeated for any item. (For example, a good RAVE weighting for a 5 choice item: 24567; not-as-good: 24467.***)

2. Have an adequate biserial correlation with total test score. The GITAP subroutine of the FORTAP (Baker, 1969) program produces an r biserial correlation with total test score for each possible response to an item. For the semantic differential, these correlations should ascend from highly negative correlations for responses near the pessimistic pole to highly positive correlations on responses near the optimistic pole. This simply means that the individuals who responded most optimistically to one item also were the ones who had "optimistic" (high) total scores on the scale. Correspondingly, the individuals who gave very pessimistic responses to an item, tended to have pessimistic (low) total scale scores. This is, of course, how each item should function: more optimistic students should react to each item optimistically and vice versa.

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*An abridged description of this program is in Appendix D.

**This was the case for ALL instruments in the EOI battery.

***This criterion was modified for other instruments in the battery. The semantic differential had the best discrimination (indicated by RAVE weights).

basically evaluative (good-bad, littered-neat, etc.). Other factors contain adjectives describing potency, understandability and activity. Studies of attitudes and values usually select adjectives which load heavily on the evaluative factor. Since this instrument was to be employed to determine the "global" orientation of children toward their world--the degree of optimism or pessimism--evaluative adjectives were considered appropriate.

The "flow chart" contained in Figure 2 illustrates the process which produced the instrument "Our World of Today/Tomorrow". Each step is discussed below.

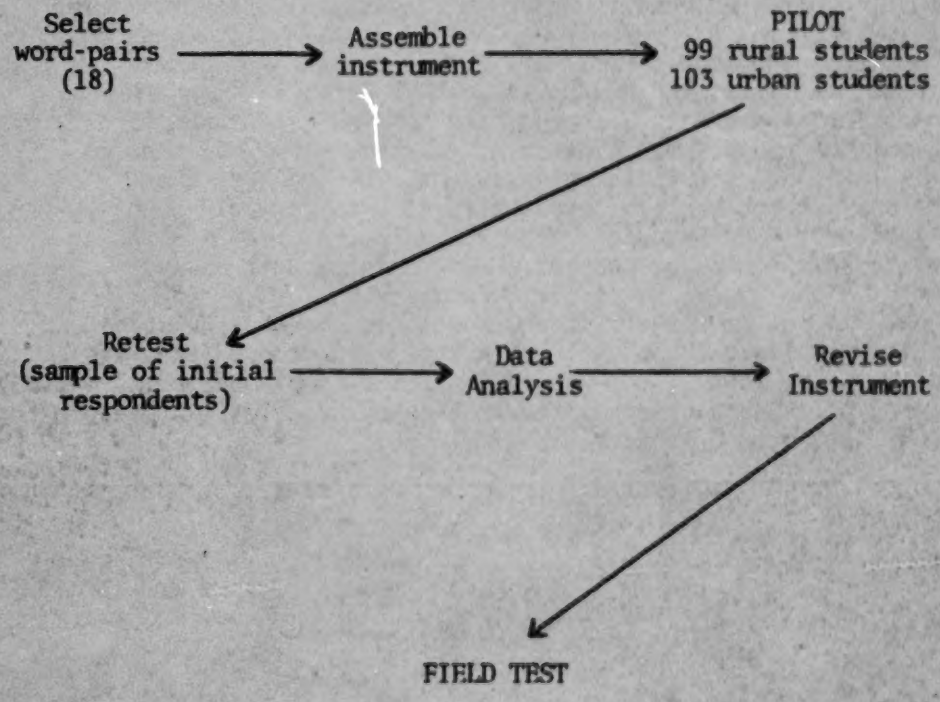

Figure 2. Development Sequence, "Our World of Today/Tomorrow"

Harris (1968) suggests a minimum desirable biserial correlation for the most optimistic response for each item of +.30. The biserial correlation for the five responses to each of the 18 items on the initial instrument was examined. The progress from negative to positive correlation was ascertained, as well as attainment of a minimum value of +.30 for the correlation of the most optimistic response for each item with total test score.

3. Cause no difficulties in interpretation for children. The word-pairs "bad-good" and "sad-happy" elicited a number of questions from children during the pilot testing. These comments indicated the individuals knew the words, but found it hard to make a judgment on "Our World of Today" and "Our World of Tomorrow" in terms of these words. Since these word-pairs also had bad statistics, they were dropped from the final instrument.

A summary of the item statistics for each word-pair on "Our World of Today" and "Our World of Tomorrow", as well as the decision to retain or omit is found in Appendix E. As indicated, the major reason for dropping a word-pair was skewed distribution (less than 5% of subjects choosing one or more responses), and/or poor discrimination (indicated by duplicate RAVE weights) among the responses for a word-pair. In choosing word-pairs for the final instrument, one additional constraint was necessary. If the two scales were to be used to compare students' EOs towards the present and future, the same evaluative word-pairs would have to be included in BOTH scales. Thus, word-pairs were retained or dropped on both scales or neither. Fortunately, this was not a serious problem. Only one of the word-pairs on "Our World of Tomorrow" did not meet the criteria mentioned above: the word-pair "valuable/worthless, cheap". This pair also functioned poorly on "Our World of Today", and was thus omitted from both scales. All other word-pairs were omitted because of their statistical performance on "Our World of Today".

The 10 word-pairs included in the field test version of "Our World of Today/Tomorrow" are included in Table 4.

Table 4

Word Pairs Retained For Semantic Differential:

Field Test

Good -- Bad	Sweet-smelling -- Polluted
Neat -- Littered	Sunny -- Hazy
Healthful -- Sickening	Clean -- Dirty
Pretty -- Ugly	Pleasant -- Unpleasant
Safe -- Dangerous	Nice -- Awful

II. Likert Scale (SOME IDEAS I HAVE):

The Likert-type format allows a respondent to react to an idea by expressing his position along a continuum between a series of bi-polar words. According to Anastasi (1961), a Likert scale provides more information than a simple dichotomous scale.

In contrast to the semantic differential technique, Likert format is appropriate when more information about the object or event is provided. It also allows greater flexibility in item construction. It was used here to measure environmental orientations towards "the environment and pollution".

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*Harris' guideline was actually developed for achievement tests having correct answers. In that context, the right or most desirable response should correlate at +.30 or more with total test score.

This instrument includes a series of statements related to environmental problems and environmentally-related behaviors; e.g., using returnable bottles instead of throw-aways. The statements were designed to be relevant to the experiences and interests of elementary and middle school age children. Philosophical items such as "Man must control nature" and those involving experiences outside the domain of most fifth or eighth grade students; e.g., "The person who owns his own land can do anything he wants with it" were avoided. As with the semantic differential, all items were constructed within the framework of environmental problems and issues deemed paramount by professionals.

Figure 3 shows the stages of development for the Likert Scale "Some Ideas I Have". A discussion of each follows.

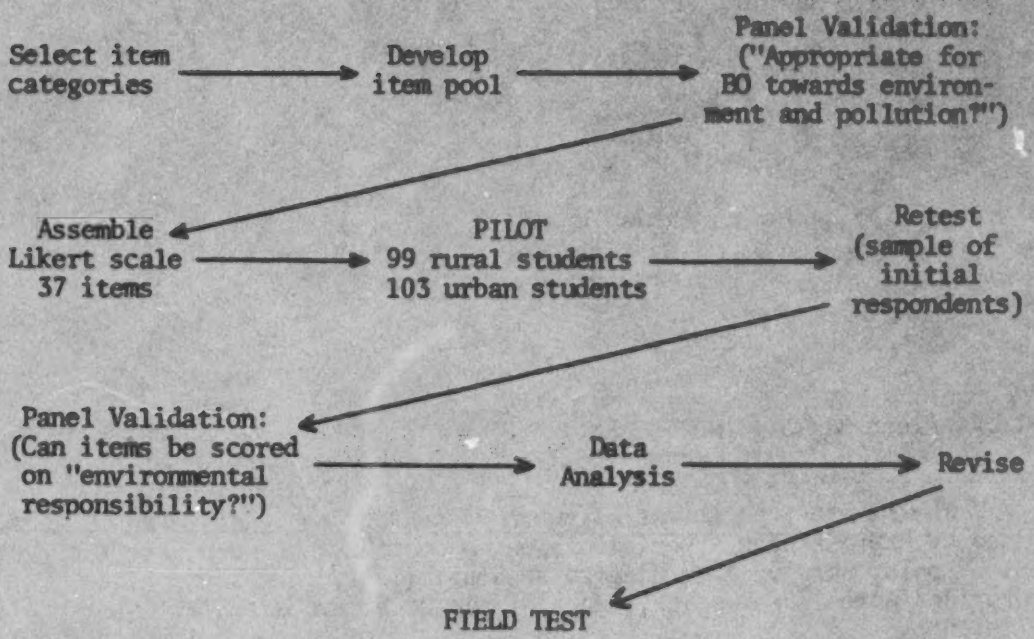
Select item categories
Develop item pool
Panel Validation: ("Appropriate for BO towards environment and pollution?")
Assemble Likert scale 37 items
PILOT 99 rural students 103 urban students
Retest (sample of initial respondents)
Panel Validation: (Can items be scored on "environmental responsibility?")
Data Analysis
Revise
FIELD TEST

Figure 3. Developmental Sequence, "Some Ideas I Have"

Initial Item Pool

The general categories used in developing the initial item pool for the Likert scale were:

1. general environmental concern/responsibility
2. protection of natural areas/wildlife
3. solid waste/recycling
4. overpopulation
5. other problems (noise pollution, air pollution, pesticides)

These areas were chosen both for their environmental significance and their potential for building items relevant to elementary and middle school children. The summed responses to the resulting items would represent a person's environmental orientation toward "the environment and pollution".

Fifty statements meaningful to children in grades 5 and 8 formed the initial item pool. The standard criteria for writing Likert statements, Edwards (1957), were followed. These initial items were analyzed by a panel of three environmental educators, who represented perspectives from social studies education, science education, and environmental studies. Judgments were made as to the appropriateness of each item for inclusion in an instrument to assess environmental orientations toward "pollution and the environment". This process reduced the pool to 37 items. The items and the decision made about their retention, based on pilot test results of their subsequent utility for the final instrument, are listed in Appendix F. All 37 items were included in the pilot version of "Some Ideas I Have".

For each item, five response choices were provided (Strongly Agree, Agree, Not Sure, Disagree, Strongly Disagree). Each choice was accompanied by a cartoon "face", visually depicting how a student felt if he selected a particular choice. This technique was suggested by Armstrong (1970). Usual procedures for assembling a Likert scale from an item pool, randomizing item position and phrasing statements to elicit both agree and disagree responses from a person with the same environmental orientation, were followed.

Two questions were added at the end of the Likert instrument. The first asked students to select which environmental problem they thought was most important and which least important from the following list: air pollution, chemical pollution, leaving some land alone, water pollution, too many people, and too much garbage. The second question asked the children to identify who could help most to solve environmental problems and who could not help much at all. The list included: me and my friends, my family, people who live around here, the mayor, the President, scientists. These questions were included to elicit additional information about children's orientations toward these problems and issues.

The Pilot Test

The Likert scale was piloted with the same groups* that completed the pilot version of the semantic differential immediately following that administration.

In addition to examining the psychometric characteristics of the pilot version, the instrument was appraised from a practical viewpoint. Things such as ease of administration and total testing time were noted. During administration, testers kept track of the kinds of questions students asked, both in terms of mechanical construction of the test--vocabulary and sentence structure--and reactions to ideas. Indications were that with revision of some items, the pilot instrument could meet general criteria for usability in schools.

One word "environment" frequently caused difficulty. Many of the children's questions pertained to the meaning of this term. No simple, comprehensible synonym or phrase suitable for these grade levels was found. Because all children tested seemed to understand what "pollution" meant, that term was used to help "explain" environment, or substituted for it, as appropriate. Examples of two revised items follow:

(pilot) Children worry too much about problems of the environment.

(revised) Children worry too much about problems of the environment (like pollution problems).

(pilot) There is too much on TV about pollution and the environment.

(revised) There is too much on TV about problems with pollution.

Responses made to a brief questionnaire administered with "Some Ideas" indicated over 90% of the students enjoyed taking the test, did not find it hard, encountered no difficult words and enjoyed "telling their ideas". Total administration time for the pilot version of "Some Ideas" ranged from 15-20 minutes, with eighth graders requiring less time than fifth graders.

Scoring Items

Items on the Likert scale were scored in terms of "environmental responsibility". The most "environmentally responsible" response for each item (either strongly agree or strongly disagree)

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*These groups are described on page 21.

was assigned five points. The other four responses were scored proportionally, with the least "environmentally responsible" choice getting a score of one.

"Environmental responsibility" was established by a six member panel, including an environmental communicator, a science educator, an interpretive naturalist, a wildlife ecologist, a social studies educator, and a botanist--advanced graduate students or professors at the University of Wisconsin-Madison. They were asked to rate each item on the pilot instrument. In part, their rating form contained these instructions:

> Rate each item according to its ability to present some environmentally-responsible action, behavior or attitude. In other words, is a response at one end of the scale for each item more environmentally responsible than a response at the other end? Does the scale discriminate?

A 4 point system was used; a rating of 4 indicated an excellent item (the response choice for the item definitely represents the degree of environmentally-responsible action, behavior or attitude), while 1 represented an ambiguous item (environmentally responsible people might line up anywhere along the continuum for this item). Items had to receive a "good" (3 points or better) rating from five of the six panelists, with the sixth rating no lower than "fair" (2 points). Items not receiving a mean rating of 2.8 or more from the panel were dropped from the instrument, regardless of other "good" statistics. The ultimate criterion for "goodness" was whether the item was considered a valid measure of "environmental responsibility".

Reliability Estimates

The internal consistency estimates for the total group of urban and rural students taking the pilot version of "Some Ideas" was .81 (see Table 5). The rural fifth graders had a Hoyt reliability of .70, while their urban counterparts were at .75; both eighth grade groups exceeded .80. The range in reliabilities (.70 to .86) showed that the test was reliable (for these groups, all exceeding the lower limit for this work).

Stability estimates, Table 6, indicated that this environmental orientation was more stable over time (5-6 days) for eighth graders than for fifth graders (.89 > .68, .87 > .60, rural and urban sub-groups respectively).

Analyses of pilot data for "Some Ideas" followed procedures described for the semantic differential, with several modifications:

1. Item scalability characteristics. RAVE weights were again employed. Since the more specific Likert statements on "environment and pollution" were not expected to attract as diverse responses as the more general word pairs on the semantic differential, it was anticipated that responses to the Likert items would have duplicate

Table 5

Means, Standard Deviations,

Hoyt Reliabilities, and Sample Sizes

"Some Ideas I Have"

Pilot Test

Community	Grade	$\bar{X}$	σ	r	N
Urban	5	130.4	13.8	.75	55
	8	137.8	14.1	.82	48
	5 & 8	133.8	14.3	.79	103
Rural	5	133.8	12.1	.70	45
	8	142.1	15.1	.86	54
	5 & 8	138.1	14.3	.81	99
Total		135.9	14.5	.81	202

Table 6

Means, Standard Deviations, Test/Retest

Correlations, and Sample Sizes

"Some Ideas I Have"

Pilot Test

Community*	Grade	$\bar{X}$	σ_x	$\bar{Y}$	σ_y	r	N	Time (days)
Urban	5	134.7	12.0	134.3	11.2	.60	25	6
	8	140.9	15.4	141.1	16.2	.87	22	6
Rural	5	133.8	12.7	134.5	14.0	.68	30	5
	8	140.7	17.9	140.4	17.4	.89	27	5

*Students randomly selected from initial groups.

RAVE weights more often. They did. The criterion for "bad" RAVE weights was modified to exclude only those items having double duplicate or triplicate weights, such as "22566" or "13444". Other criteria for scalability--wide range of weights plus good spread and each response chosen by at least 5% of the total sample--remained unchanged.

2. Biserial correlation with total test score. The same criteria were employed as with the semantic differential. The response made to a specific item should correlate highly with total test score in terms of "environmental responsibility".

3. Cause no difficulties in interpretation for children. On the basis of the pilot, some items needed word revisions to clarify them for the target population. No items were dropped due to this criterion.

Two additional criteria were used in analyzing Likert pilot items:

4. Mid-range mean score. If the instrument is to have maximum utility for measurement purposes in environmental education, the mean response for each item should not be skewed to either end of the scale. Most people now consider being "against" pollution in the same category as "apple pie, motherhood and the American flag". Thus, items assessing environmental orientation toward pollution and the environment where responses would NOT fall at one end of the scale were difficult to produce. Nevertheless, it was decided to retain only non-skewed items. Items with mean responses in the mid-range (2.0-4.0) of the 1.0 to 5.0 scale, helped produce an instrument capable of registering change in either direction, a necessary characteristic if the test is ever used in "pre/post research", or for other comparison purposes.

5. Good variability. The variance is a quantitative measure of the "spread" of responses to the item. Variances greater than 1.0 were desirable.

Item Revision

A summary of item characteristics based on the five criteria discussed above, together with the validity panel scores for each item (ability to discriminate "environmental responsibility") are contained in Appendix G. The decision whether to retain, modify or omit an item is also included. Of the original 37 items, ten were retained unchanged. These items were all acceptable to the validity panel and had acceptable item statistics. Fourteen items were modified from their pilot formats, either to make them more comprehensible to children, or to attempt to improve their statistical performances. Item 29 illustrates both types of modifications.

29. (pilot) Overpopulation (too many people) is the cause of many problems today.

This item was rated highly by the panel (3.4). However, the response distribution was skewed--only 4 people in the total group "strongly disagreed". Children were also confused by the word "problems". Were these personal or school problems, or what? The item was revised:

29. (revised) The cause of many problems in the world today is too many people.

"Overpopulation" was dropped as confusing and redundant, and the phrase "in the world" was added to illustrate the global nature of the problem. The revision was made to attract a wider range of responses. Generally items such as this, possessing adequate panel ratings, but less than adequate statistics, were revised and included in the final instrument. Thirteen items from the pilot, however, were omitted completely, due to low panel ratings and/or poor statistics. The omitted items covered a variety of concerns: recycling, littering, individual action towards alleviating problems, etc. However, no item category was depleted due to omission of these items.

New Items

In addition to the 24 items retained, three new items were included in the final field test instrument to partially replace those dropped from the pilot. These items bolstered necessary coverage of the environmental orientation, and also helped maintain a reasonable test length for reliability purposes. The statements chosen for the new items probed the same areas as omitted items. They were:

Protesting about pollution helps to make things better.

Too much noise is really a problem to worry about.

Usually, it is best to write on just one side of a piece of paper.

The new items were "piloted" in the field test. If their statistics were bad, they would not be included in analysis of data from the field test. However, all items piloted and approved for the field test were to be included in the final data analysis.

Twenty-seven items plus eight distractor items, included to help avoid creation of an environmental response set; (e.g., Gym

class is the best class in school.), comprised the field test version of "Some Ideas".

The non-Likert items related to the most/least important environmental problems and who could help most/least were also used. Responses to the pilot versions of these items indicated that clarification of instructions was necessary. When students were asked to pick ONE most and ONE least important environmental problem, fifth graders particularly often selected more than one per category. This was attributed to poor instructions. The instructions were modified to force one response per category on the field test version.

The field test version of "Some Ideas I Have" is included in Appendix J .

III. Environmental Decision Inventory (STORIES ABOUT REAL LIFE PROBLEMS):

The third instrument in the EOI focused on environmental orientations toward specific environmental problems, described in story formats appropriate for elementary and middle school children. For each story, the children were asked, "How do you think this problem could be solved?" The obtained responses represented children's "decisions" regarding these problems. The instrument is referred to as the Environmental Decision Inventory (EDI) even though the title used on the actual instrument was "Stories About Real Life Problems".

The EDI had the strongest empirical base. Stories were initially written for the children, but once this was done all remaining development work was by the children--i.e., based on children's reactions to the problems. A conscious effort was made to avoid adult impositions on the children. This empirical framework will be evident as EDI procedures are outlined.

EDI development work was spread over two pilots and involved some 700 children. Figure 4 shows the various operational stages for this instrument. Each is discussed below.

Environmental Problem Stories

Eight environmental problem areas were selected for preliminary development work on the EDI. As before, the criteria used for selecting these problems included pertinence to the world environmental situation as well as meaningfulness and appropriate-

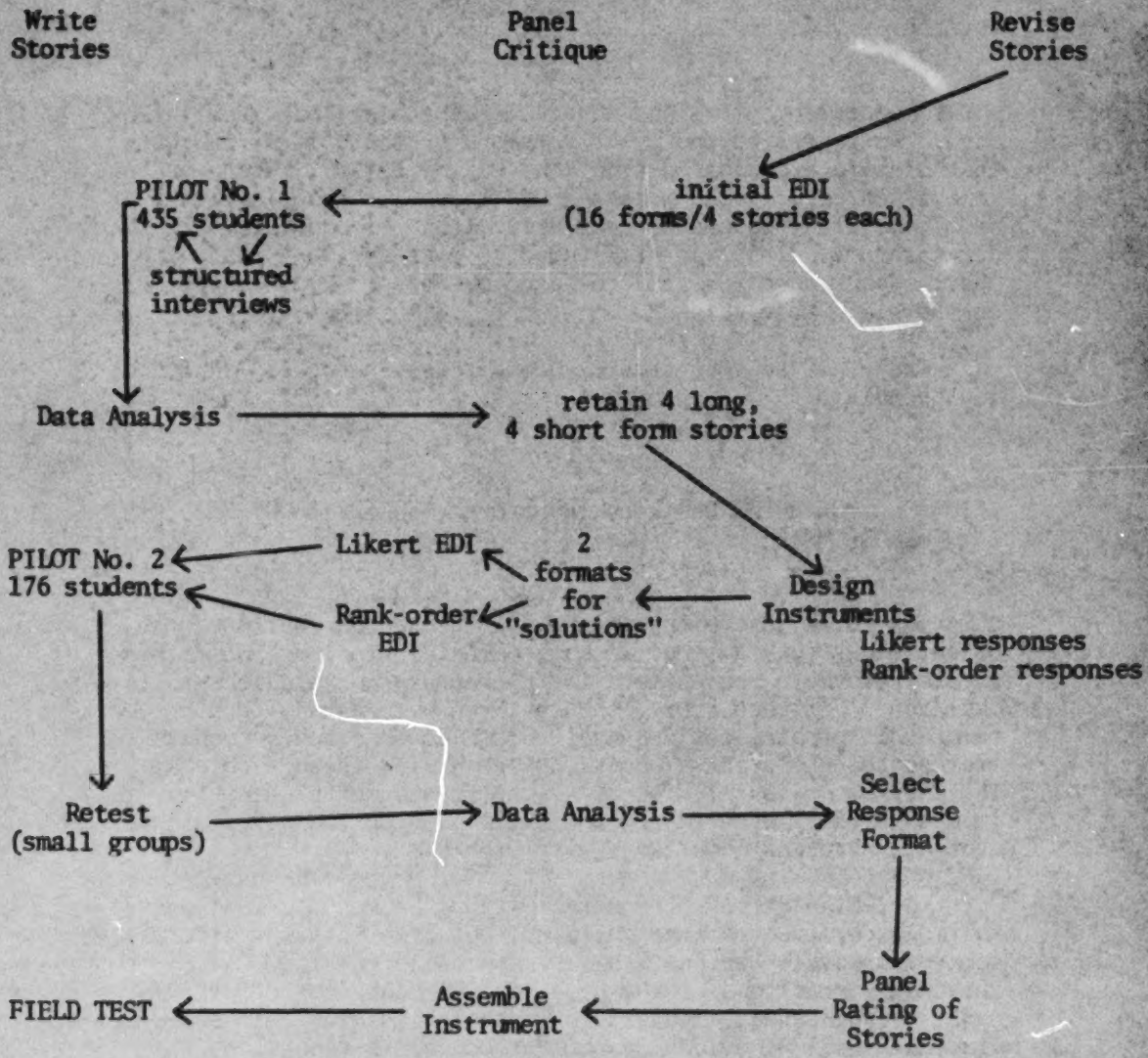

Figure 4. Developmental Sequence, The Environmental Decision Inventory

ness to children in the target populations. The eight problem areas were:

1. Strip mining
2. Clear cutting
3. Air pollution (urban)
4. Air pollution (rural)
5. Water pollution
6. Land use
7. Wilderness use
8. Solid waste/recycling

The situations represented a diversity of environmental problems, with emphasis on conservation-oriented topics (strip mining, clear cutting, wilderness use, solid waste/recycling) to more recently developed concerns of environmental education (air pollution, water pollution, land use). Because the research review had demonstrated the familiarity and importance of air pollution to children, two different community manifestations were included.

The stories attempted to describe a specific environmental problem and show the major competing interests and conflicting desires surrounding such issues in real life. Yet the stories had to be understood by upper elementary school children. They could not be too complex. Available testing time required limiting each story to one typewritten page, a maximum of 300 words. Choices had to be made about what to include in these stories, e.g., what factors regarding the clear-cutting of a forest should be presented.

Initial stories were written and revised based on the constructive criticism of a two member validity panel: a science educator and interpretative naturalist at the University of Wisconsin--Madison.

Each story was prepared in a long form and a short form. The long provided more information to use in deciding how to solve the problem. This was done to determine the effect of story length and information load on the responses. No essential information (as judged by the panel members) was omitted from the short form.

Pilot No. 1

The short and long forms of each story thus totaled 16 "items" for use in the first pilot. These stories were used to prepare 16 different forms of the instrument, each containing four stories. Each form had at least one long and one short story, and selections about both conservation problems and more environmental problems. Table 7 identifies the stories contained in each form. These sixteen test forms were assembled

Table 7

Distribution of Stories Across Forms

Environmental Decision Inventory

Pilot No. 1

Form:	Wilderness Use		Clear-Cutting		Strip Mining		Air Pollution (rural)		Air Pollution (urban)		Water Pollution		Solid Waste/ Recycling		Land Use	
	a	b	a	b	a	b	a	b	a	b	a	b	a	b	a	b
1	X				X					X				X		
2		X				X			X				X			
3		X	X							X	X					
4	X			X					X			X				
5				X				X			X		X			
6			X				X					X		X		
7			X				X					X				X
8				X				X			X				X	
9					X			X			X					X
10						X	X					X			X	
11						X			X		X				X	
12					X					X		X				X
13		X					X			X				X		
14	X							X	X				X			
15				X					X				X		X	
16			X							X				X		X

a=short form
b=long form

in packets of about 30 booklets each, by a random process. Each successive student in the various classes tested received his test from the top of the pile which, in essence, produced a random assignment of test form to student.

Students read the stories and proposed their ORIENTATION about how to solve the respective problem. No solutions were provided. The students wrote their own ideas, and were encouraged to write as much as they wanted. Time was not limited.

Since each student received only one form of the EDI, he gave his ideas related to only four of the eight problem areas. This was done for practical considerations, student endurance in taking a test of this type. However, through the procedures used to mix students and stories, the maximum amount of information for amount of individual time expended was obtained.

Pilot No. 1 was conducted during May and September, 1972, in eight schools in five Wisconsin communities. Reactions to the stories were obtained from students in different environments: rural and urban communities, communities dependent on agriculture and those dependent upon industry, and minority groups. A total of 435 students in grades 5, 6, 7, and 8 were involved. The distribution of students in this pilot is presented in Table

Data Analysis

The children's responses were enlightening. Just as adults, different children perceived these problems differently. The most prominent response had a "personal orientation". This was typified by a concern for the personal problems of the family or individual portrayed in the story, more-or-less oblivious to other issues. For example, on the story about wilderness protection, a child with this personal bent would focus on the family disagreement (where to go on vacation; somewhere to hike and camp or where you can see a lot from the car). To the problem of air pollution in the large city or water pollution from the paper mill he'd likely to respond "Move away and get a job somewhere else."

Faith in technology was also evident in the responses. Many devices and complicated machines were suggested to solve the air and water pollution problems. In fact, several students went to the trouble of drawing their "Rube Goldberg" contraptions.

There were also those who echoed the "eco-extremists" view, "Shut it down regardless of the consequences." Although most of these responses were phrased in one or two short sentences, several longer solutions were posed. On the paper mill story, one Indian boy said:

...they should close it down and try to fine (sic) something to clean it up so the living plant and animal can live. If they didn't stop we prombley (sic) have no drinking water and no fish to eat and when the Indian came they didn't put garbage in the water.

Two readers analyzed the responses and developed response categories. While some stories had "unique" solutions, many solutions were similar across stories. These included (1) a personal orientation toward the problem, (2) approval of the pollution alleviation technique described, (3) a compromise solution, (4) stopping the pollution regardless of the consequences, and (5) technological solutions involving filters, machines, etc. These response categories and the accompanying stories (long and short) are in Appendix H.

Table 8

Distribution of Students Taking the EDI

Pilot No. 1

School

Grade	Rural	Small Town A	Small Town B	Medium Sized City	Inner City	Total
5	25	56				81
6	25	52	106***	60	30*	273
7			17**		28*	45
8			12**		24*	36
Total	50	108	135	60	82	435

*Black students
**American Indian students
***Includes 14 American Indian students

Once response categories were established, two people independently classified each student's responses using content analysis procedures. Observer agreement exceeded 95%. The number of students writing down each solution and observer agreements for classifications are listed in Appendix H.

The Chi square statistic was used to determine whether there were significant differences in the frequencies of solutions proposed, for each problem, between the long and short forms. (Chi square values are included for each story in Appendix H.) For four of the eight problems, there were significant differences in response frequencies ($\alpha = .05$). These four stories were on clear cutting, strip mining, water pollution, and land use.

The results of this analysis showed how importance it is to provide sufficient information when children are asked to deal with topics apt to be unfamiliar to them. The four problems with N.S.D. between story forms dealt with situations children are likely to have encountered (wilderness preservation; air pollution, rural; air pollution, urban; solid waste/recycling). Information load and story length did not affect the diversity of solutions children offered for these problems. Two stories in the S.D. between forms group dealt with problems not as familiar to a majority of Wisconsin elementary school children (Clear cutting, Strip mining). In both instances, providing more information about the problem resulted in a greater number of students approving the solution techniques, with limitations (Appendices H-2 and H-3).

A third "S.D." story considered water pollution associated with a paper mill. There are numerous paper mills in Wisconsin, but many of the 292 students who reacted to the story were not aware of the associated pollution problems. The response pattern, from short to long form, parallels the other stories, greater acceptance of the mill's water pollution when the complexity of the problem is more thoroughly described. (Appendix H-6)

The fourth story with a significant difference in responses between forms was about land use, but the differences in response frequencies here did not seem tied to familiarity. The solution ("more parks") that contributed most to the large Chi square value between forms (Appendix H-8) was included only in the long form. Thus, children receiving the long form were primed for this as a possible solution. Children receiving the short form of this story had to "think up" parks as a solution.

Where no significant differences in response frequencies across forms were obtained, the short form of the story was retained for the next testing stage. Where statistical differences were found, the long form of the story was retained.

To identify any reading problems and to obtain another form of response to the stories, 56 children were randomly selected from this pilot group and given individual semi-structured interviews. They:

a. read two stories out loud (selected at random from the eight "long form" stories)

b. looked at 35mm color slide illustrations of the problems while the interviewer read the stories back to them.

c. gave their opinions on solutions and responded to a series of probing questions about the problem.

These interviews were recorded on audio tape. Analysis of the tapes provided additional input for formulating response categories, and provided more insight into children's orientations towards specific environmental problems. Difficulties with comprehending or interpreting stories were also probed during these interviews.

EDI Revision

A total of 4 long and 4 short-form stories were retained for Pilot No. 2. Minor modifications were made in the language of the stories. Analysis of the results also provided the possible alternative solutions for students to select from in the revised format; empirically derived from students' perceptions rather than adult interpretations.

In preparing for the second pilot, two matters were reconsidered. Initially problems related to population were thought to be too complex for the children. However, the children's responses indicated that some children were aware of overpopulation and its influences on many environmental problems. Therefore, a "population" story was included in the revised EDI. Further, many of the initial stories were marginal in terms of the immediate experience of many children (strip mining, clear cutting, etc.). It was intended to include a range of problems from "global" to local situations, but the first version of the EDI "slighted" local orientations. Another story (a tree in the schoolyard) was added to increase the proportion of local character. Thus, the second version EDI had ten stories about environmental problems.

For the two new stories, students were first asked to respond to a set of prepared "solutions" and then suggest other alternatives. This procedure allowed for testing predictions about children's responses, based on initial results while maintaining the empirical base; i.e., children produced the solutions. These responses were input for revising the solutions included in the field version of the EDI.

Because of the variability in the children's experience and knowledge of the environment, a black and white photo was included with each story. This gave every child a common referent to the problem and illustrated story content. This common stimulus helped clear up language ambiguities. For example, clear-cutting was described as leaving big "holes" in the forest. Students often interpreted this as excavations. The picture on clear-cutting (and changing "holes" to "open spaces") resolved this difficulty.

Formats for "Solutions"

The student-generated "solutions" to problems were arranged in two different formats to see which format was more appropriate for this age child. The first arrangement required children to rank-order their preferences for the various solutions to a problem. The second arrangement presented the solutions in "Likert statements". Here, respondents indicated their agreement (agree to disagree, 5 point scale) with each separate solution. Use of two formats made it possible to see if students would discriminate among several solutions to the same problem (rank-order) or would tend to agree with solutions that were, in reality, opposite positions (Likert).

"Action-Orientation" Scale

An identical "Action-Orientation" scale was included in both forms. This scale consisted of the statement "If I lived there, I could help solve this problem" at the end of each of the 10 environmental problem stories to which students responded by circling YES or NO. These responses indicated how much students felt they could contribute to alleviating each problem, and environmental problems in general. This "Action-Orientation" might show a student's degree of optimism about the nature of environmental problems, and would also indicate how much students felt they could contribute to problem-alleviation.

Pilot No. 2

This pilot was conducted in a suburban community near a large urban metropolis during April, 1973. 176 fifth and eighth grade students (approximately equally divided between sexes) participated. The two forms of the EDI were randomly assigned to packets of thirty tests, each packet containing approximately equal numbers of both forms. 49 and 47 fifth graders received the Likert and rank-order forms respectively, while 40 eighth graders reacted to each form. Tests were distributed using the procedures detailed earlier, producing a random assignment of tests to students. Introductions and other administrative procedures were similar to those employed in earlier testing.. Total

administration time was about 45 minutes, with students in grade five again requiring more time.

A questionnaire was included with both forms to obtain student reactions to the instrument. About 70% of the students reported the test "easy to do", while less than 2% thought it "hard". Fifth grade students found it more challenging though, as indicated by 28% reporting the test, "not easy, not hard", compared to only 13% of the eighth graders choosing this response. No reported differences in difficulty between the two forms were evident. Over 90% of the students in both grades indicated:

a. they understood the directions.
b. there were no hard words.
c. they enjoyed telling their ideas.
d. the stories were easy to understand.
e. they enjoyed reading the stories.

Reliability Estimates

An internal consistency estimate of total test reliability was not appropriate for this instrument because it could not be considered a homogeneous measure of one environmental orientation. Reliability estimates were determined as follows:

1. Stability. Test/retest correlations were calculated for the various groups taking the two forms of the EDI. Stability estimates for the Likert format were .64 (grade 5) and .78 (grade 8) over a 7 day interval (Table 9). These correlations were higher than the stability estimates for the rank-order format (.50 and .69 respectively). The difference in stability between these formats can be partially explained by the non-independent character of responses in the rank-order format. For example, if the preferred solution to a specific problem was changed during retest, this forced one or more other changes. This was not the case with the independent statements contained in the Likert format.

2. Internal consistency of the "Action-Orientation" scale. It was felt that responses summed along this scale would measure an underlying ORIENTATION toward being able to help solve environmental problems. Responses were scored two points for a Yes, one point for a No, and 0 points for no response. Hoyt reliability estimates for this subscale are reported in Table 10. The estimates were in the mid to upper seventies, with no discernible difference in internal consistency across grade or instrument format.

Table 9

Means, Standard Deviations, Test/Retest

Correlations, and Sample Sizes

The Environmental Decision Inventory

Pilot No. 2

Format	Grade	$\bar{X}$	σ_x	$\bar{Y}$	σ_y	r	N	Time (days)
Likert	5	144.5	10.8	140.8	11.4	.64	17	7
	8	148.3	11.3	152.1	15.2	.78	16	7
Rank Order	5	133.5	13.2	140.5	14.8	.50	19	7
	8	145.8	18.7	147.8	17.9	.69	17	7

All students randomly selected from total group.

Table 10

Means, Standard Deviations,

Hoyt Reliabilities, and Sample Sizes

"Action-Orientation" Scale

The Environmental Decision Inventory

Pilot No. 2

Format	Grade	$\bar{X}$	σ	r	N
Likert	5	5.9	3.3	.79	49
	8	5.7	3.0	.76	40
	5 & 8	5.8	3.2	.77	89
Rank Order	5	5.8	3.1	.77	47
	8	5.9	2.9	.75	40
	5 & 8	5.8	3.0	.76	87

Format for Field Test

The Likert format was utilized in the final field test instrument. There were several reasons for this decision. First, students did discriminate between opposing solutions on the Likert format EDI. Second, stability estimates were higher for the Likert format. Third, a major assumption of inferential statistics which involves independent responses on each item of an instrument was seriously violated by the rank-order procedure--i.e., once a student chooses a solution, the rankings assigned to the remaining solutions are NOT independent.

One valuable feature of the rank-order format, however, was preserved. After students indicated their degree of agreement with each solution to a specific environmental problem via a Likert statement, they were asked to check the one solution they preferred for each environmental problem. This gave an indication of preferences as well as amount of agreement or disagreement with several solutions to a problem.

Solutions provided to the two new problems (tree in the schoolyard and overpopulation) included in this pilot were revised for the final EDI. Two of the original "solutions" to the overpopulation problem had been:

"Move extra people to the moon and other planets."
"Stop all medicines. Some will get sick and die. This will help solve the problem."

The children thought these answers were "far out". Several said they couldn't believe children would suggest these things as "good ways to solve the problem". So the following three popular student-generated solutions were substituted:

"Get more land to make Freeland bigger."
"Stop people from coming to Freeland. Let some move away."
"Pass a law to make parents have fewer children."

The "school tree" story responses were revised also. On the basis of student solutions, the following solutions were added:

"Don't do anything. Leave the tree alone."
"Move the tree somewhere else. This will make more room for cars and children."

Because it overlapped with the new solutions, an original solution "Help the tree get healthy again. And move the parking lot somewhere else," was omitted from the final EDI.

At this point, the six member validity panel rated each story to be included in the final EDI on a four point system. In part, the panel members received the following instructions:

These stories attempt to briefly present a specific environmental problem. Various 'schools of thought' on the problem are included...Within the framework of dealing with problems on the level of a middle school child, please read and mark each problem according to the following scale:

4 -- excellent.	Presents the multi-faceted story well.
3 -- good.	Presents major dimensions of the environmental problem.
2 -- fair.	Omits some very important dimensions.
1 -- poor.	Too far removed from the real world or omits major dimensions of the situation.

The mean score assigned to each story by the panel was 3.0 or greater. Thus, all were considered appropriate to include in the final EDI. (Comments made by the panel were employed in making minor story revisions.)

The pilot forms of the instruments in the EOI are found in Appendix I.

Our World of Today/Tomorrow
Some Ideas I Have
Environmental Decision Inventory
Answer Book: Rank-order
Answer Book: Likert

CHAPTER IV

FIELD TEST RESULTS

The final phase of the study consisted of a field test of the three instruments in the Environmental Orientation Inventory. Additional verification of the stability and reliability of the instruments was sought as was information about the possible existence of "factors" within the more general orientations. It was desired to obtain a better cross-section of input from the various target populations who might respond to the instruments in the future.

A total of five variables that could influence environmental orientations were dealt with in the field test. These were community, grade level, sex of student, I.Q., and socioeconomic status. Considerations involved in selecting school systems and students for participation are described below.

Residential Community--A cross-section of communities was desired, from rural farm-based communities, to suburbs, to metropolitan areas (including inner city ghettos, working class ethnic neighborhoods, and schools in outlying areas). No random choice of communities is claimed for this study, but communities were selected to represent the characteristics described.

The Rural communities were the towns of Richland Center (population 5,200) in Iowa county [southwestern Wisconsin], and Seymour (population 2,000) in Outagamie county [east central Wisconsin]. The economy of both is farm-based, with a few small industries. Children attending schools in these towns come from within city limits and outlying farms. In Richland Center, two elementary schools provided 72 and 34 students (their entire fifth grade) for the study, while 102 eighth grade students were drawn from the local high school in a non-random fashion. Seymour provided one fifth (24 students) and one eighth (21 students) grade class, chosen at random from the local schools. While Richland Center has no appreciable minority group representation, about 10-15 percent of Seymour's student population is of American Indian descent.

Two schools in Muskego (population 7,000) in suburban Waukesha county [approximately 10 miles from the Milwaukee city limits] represented the Suburban Community. The flavor of the immediate area is one of open countryside, with "room to breathe." There is abundant industry in the immediate area. A group of 98 fifth grade students was randomly chosen from the entire fifth grade at the participating elementary school and 102 eighth grade students were randomly chosen from the total eighth grade group at the participating intermediate school. A smaller group of Muskego fifth and eighth graders selected from the original random sample took the EDI portion of the EOI.

The city of Milwaukee, largest urban center in Wisconsin, represented the Urban Community. The Department of Educational Research, Milwaukee Public Schools, arranged for selection of eight schools from various areas in the city on a stratified basis to insure a cross-section of urban schools. The testing team saw the diversity among these schools, and the respective neighborhoods. Four elementary and four junior high schools each provided one class for the field test, a total of 118 fifth graders and 94 eighth graders. In this urban "sample," input from minority groups (Blacks and Spanish Americans) was obtained. While there was no guarantee of the representative character of the class tested at each school, I.Q. data revealed the presence of a wide range of abilities.

Socioeconomic Status--Each student listed his father's and/or mother's occupation on a questionnaire. Wherever possible, school records and information from classroom teachers were used to validate this information.

Occupation seems to be a reasonably valid indicator of socioeconomic status. Kahl and Davis (1955) analyzed 19 different indicators of class position and found occupation, above all, to be most valid.

The Edwards (1943) index of class position based on occupation has often been used in establishing SES groups, perhaps due to its "official" nature [Edwards was with the U.S. Census Bureau] and rather impressive statement by its developer:

> ...each of these groups represents not only a major group of the Nation's labor force, but, also, a large population group with a somewhat distinct standard of life, economically, and, to a considerable extent, intellectually and socially. (p. 179)

However, as Hodges (1964) pointed out, Edwards' assertion was more of an inference than a statement grounded in fact or experimental proof, and is considered by many critics as rather sweeping and subjective.

For this study, a scale for occupational assignment based on "prestige ratings" was employed to group students by SES. The North-Hatt scale (1947) is a popular ranking of 90 occupations by a large cross-section of Americans. At the top of the list are physicians, college professors, bankers, and ministers. At the bottom are shoe shiners, street sweepers, garbage collectors, and bartenders. Translated into occupational groupings, the "prestige" order is:

1. professional and semi-professional workers
2. proprietors, managers, and officials
3. clerical, sales, and kindred workers
4. craftsmen, foremen, and kindred workers
5. farmers and farm managers
6. farm laborers
7. service workers
8. laborers

The complete list of ninety occupations is contained in Hodges (1964).

Aptitude--Data from the following IQ tests were used to identify students from high, medium and low I.Q. groups:

California Test of Mental Maturity, Form S

Lorge-Thorndike Mental Ability Test

Kuhlmann-Finch Test of Mental Ability

Otis-Lennon Mental Ability Test

These tests all have reported means of 100, and similar standard deviations. Classifications by IQ were made only for those students who had IQ scores no more than two years old. The procedure for assignment to categories was:

High = IQ score greater than .8σ above a mean of 100.
Medium = IQ score within .8σ [either side] of a mean of 100.
Low = IQ score greater than .8σ below a mean score of 100.

These criteria were used to insure a wide and diverse representation from the many sources of input that could produce variance in test scores representing environmental orientations.

Field Test Procedures

At the outset of the field test, each child filled out a "Student Information Sheet " (Appendix N). Responses were helpful in determining levels of Socioeconomic Status and Community assignment.

The semantic differential and Likert scales were administered in one session and the EDI was usually administered at another time. For fifth graders testing was often organized around a recess period, while for eighth graders the EDI portion of the EDI was taken later the same day or the following day. The total testing time was approximately 90 minutes: a 30 minute period for the "Our World" and Likert scales, and a 60 minute period for The Environmental Decision Inventory. These time allocations were adequate for nearly all students. For those students requiring more time (primarily several "slow" readers in fifth grade), the classroom teachers allowed the students to complete the instrument later the same day.

No major problems were encountered during the field test period. Introductions and explanations for each instrument were virtually identical with their pilot counterparts and instructions and testing details were similar to those outlined for the pilot studies. Students and teachers were generally cooperative. Both class size and larger groups were employed in the testing, at the convenience of participating schools.

Field testing was completed during the period from May 7 to May 25, 1973. All tests were administered by the project staff to

Table 11

Distribution of Students

Participating in the Field Test

Independent Variable:		Community: Urban	Suburban	Rural	TOTALS*
Sex	Boys	95	103	139	337
	Girls	112	94	96	302
IQ	High	48	63	100	211
	Med	86	107	113	306
	Low	73	26	16	115
SES	High	16	46	25	87
	Med	145	135	187	467
	Low	42	11	10	63
Grade	5	116	98	122	336
	8	91	99	113	303

*Totals across all levels of an independent variable are less than 665 students (the number of students in the field test) because some students were omitted from community, IQ, or SES classifications.

a total of 665 students in four communities. Table 11 shows the distribution of students participating in the field test.

Factor Analysis of EOs

Factor analysis was used extensively in field test analysis of both "Some Ideas" and the "Environmental Decision Inventory". The "Our World" scales were factor analyzed, but not until "Some Ideas" and the EDI did factor analysis play a central role in interpreting results. A brief discussion of this analysis tool follows.

According to Harman (1967), factor analysis is used to seek interrelationships among a set of variables, no one of which is singled out as being "more important" than any of the others.

"Patterns" of responses are sought. Do certain groups of items tend to be answered similarly (or oppositely)? When a person answers an item, are there other items on the test that he reacts to in a similar fashion?

Most factor analyses* begin with a correlation matrix, which shows how the responses for each item correlate with responses for every other item on the instrument. Using this base, factor analysis programs produce factors, which Kerlinger (1965) defines as "constructs, hypothetical entities that are assumed to underlie tests and test performance." (p. 650) These factors are arranged in a matrix, a table of coefficients that show the relations between individual items and underlying variables. (Here the "underlying" variables are ENVIRONMENTAL ORIENTATIONS.) The entries in the table are called factor loadings. They range from -1.00 to +1.00 as do correlation coefficients, and are interpreted similarly.

Factor analysis was used to determine the homogeneity or heterogeneity of each instrument in the ENVIRONMENTAL ORIENTATIONS Inventory. Based on results of the pilot work, factor analyses of the "Our World" scales were expected to reveal one principal factor, but with the Likert scale and the EDI, several factors might be forthcoming. On these instruments, groups of items might reflect a number of, possibly mutually exclusive, ENVIRONMENTAL ORIENTATIONS. For "Some Ideas", the procedure could produce a set of sub-scales, each "contributing" to the total orientation towards "environment and pollution." In the case of the EDI, factor analysis could help "sort out" patterns of student responses to the various "solutions" proposed for environmental problems. Various factors identified here could represent BOs also, whether the items loading heavily on them were all drawn from one or a number of environmental problem stories.

To summarize, we used factor analysis to help pick out the various BOs underlying both "Some Ideas" and the EDI. Of course, the item clusters, each loading on separate factors, were not "guaranteed" interpretable as ENVIRONMENTAL ORIENTATIONS for factor analysis invariably involves considerable judgment as to what factors are "important" and how they are interpreted within a given framework.

Interpretation of Factors

Just how were the factors interpreted? What procedures were used to "produce" an BO from a group of items loading heavily on a factor?

*There are a number of factor analysis procedures in common use. According to Edwards (1970), the Principal Components procedure with Varimax rotation of factors is widely accepted and employed in psychological and educational research. This was the procedure [part of the FACTOR2 Computer Program (STATJOB series, Madison Academic Computing Center, University of Wisconsin--Madison)] employed for all factor analyses in this study.

Interpretation was NOT done on the so-called "raw" factor matrix obtained from itiitial correlations of items with each other. A Varimax rotation of the initial factors (or some subset) was used to obtain rotated factors that had as few items as possible "spread" across more than one factor. In other words, each rotated factor had a number of items strongly correlated (or heavily loaded) on that factor. All other items would, ideally, have "weak" loadings on the factor. ("Raw" factors usually aren't as easy to interpret.)

The following sequence was used to interpret factors on both "Some Ideas" and the EDI:

1. Common content was identified for items loading heavily (.40 or greater) on the same factor, either explicitly or implicitly stated.
2. An ENVIRONMENTAL ORIENTATION was hypothesized to represent the common content of the items.
3. Logical verification was attempted to determine the usefulness of the EO. For this purpose, a "criterion" individual was invented, who held an extreme position in relation to this EO.
4. Each item on the factor was examined, and a response projected on the basis of this extreme individual.
5. The pattern of responses was inspected, and, if consistency was obtained, an ENVIRONMENTAL ORIENTATION was postulated for that factor.

This procedure was set up to assure that each item within a cluster should contribute, in a logically consistent fashion, to the EO.

EO Reliability Estimates

Once factors were identified as specific ENVIRONMENTAL ORIENTATIONS, a reliability estimate was computed for each set of EO items. While all items in the ENVIRONMENTAL ORIENTATIONS Inventory had "passed muster" as part of their respective instruments, it was appropriate to see if these "new" combinations would still meet the reliability criteria of this study.

Reliability estimates were derived from the individual item communalities included in output from the FACTOR2 computer program. According to Guertin and Bailey (1970), "the test-retest reliability coefficient for an item is unlikely to be less than the square root of its communality." (p. 215) An item's communality estimate is defined as the variance that the factor matrix accounts for on that variable. Since the relationship between communality and test-retest reliability is a square root one, an item whose communality was .36 would have a reliability of .6; an item whose communality was .49 would have a reliability of .7; and so on.

The procedures used to interpret communalities and estimate reliabilities for the various EOs were those suggested by Guertin and Bailey (1970):

> We find that communalities of questionnaire items frequently average .40 or better...The square root of .40 is about .63, which is very adequate reliability for single items. We join items together to give subscales that are more reliable....When you combine four or five items with reliability coefficients averaging .60, you will have a reliable measure of the attribute that you are seeking to measure. (p. 216)

In each instance, items combined in an EO had reliability coefficients averaging .60 or greater.

As each EO identified through factor analysis is further discussed, the test-retest reliability coefficients for each item in that EO (based on the item communality) will be reported.

Scoring EOs

A scoring system consistent with the nature of each EO was developed. For example, one factor was identified as an EO towards technological solutions to environmental problems. The response position (either strongly agree or strongly disagree) for each item on the factor which represented the greatest faith or dependence on technological solutions was assigned a weight of 5. Other positions were given proportionally lower weights. Thus a score on this EO could be obtained for each individual, and ultimately, groups could be compared across any one of several independent variables. Similar procedures were followed for the other EOs.

Before the scores produced by the total tests or the derived sub-scales (EOs) could be utilized in any one of several research or evaluation studies, the psychometric characteristics of the instruments need to be known. Knowing how each instrument functioned in the field test is extremely important in interpreting any "significant" differences in respondent's scores.

All reliability estimates and other item statistics that follow were calculated using the same techniques described in Chapter Three. Only when a value reported is based on a statistical procedure not previously described will the procedure be discussed.

OUR WORLD Scales

The item statistics for the ten word pairs employed on the two scales were determined from responses of all students, and deemed acceptable by previously stated criteria (see Chapter Three). The discrimination was generally excellent*, and correlation of any

*With one exception: "sunny-hazy" had RAVE weights of "65331" on "Our World of Today". The word-pair functioned well on "Our World of Tomorrow" however.

"optimistic" response with a similar "optimistic" total score on the same scale was very good. Item statistics for "Our World of Today" and "Our World of Tomorrow" are reported in Appendix K.

As in the pilot work this semantic differential again exhibited very good Hoyt reliabilities. Tables 12 and 13 show the internal consistency estimates for each group tested on "Our World of Today". The lowest Hoyt r was .81, for suburban fifth graders; and the "rs" ranged as high as .94. For the eighth grade groups the reliabilities ranged from .82 to .95.*

Even higher internal consistency estimates were obtained for "Our World of Tomorrow". Tables 12 and 13 also show these values: for fifth graders, .93 to .97; for eighth graders, .94 to .98.

The high reliabilities indicate that student responses to the two scales are extremely consistent. This provides support for the earlier postulation of a single factor on each scale, representing an ENVIRONMENTAL ORIENTATION towards the present on "Our World of Today" and an ENVIRONMENTAL ORIENTATION towards the future on "Our World of Tomorrow".

A factor analysis (principal components, Varimax rotation) of the responses of the 665 students taking the "Our World" scales further supported this contention. Table 14 shows the results. Both "Our World of Today" and "Our World of Tomorrow" were unifactorial. Each word-pair on Today and Tomorrow loaded at +.56 or more on the indicated factor. These results also supported the common "evaluative" nature of the word-pairs used on these scales, as discussed in Chapter Three.

The stability estimates for the two "Our World" scales are included in Table 15. Two eighth grade groups and one fifth grade group were retested on these scales after 4-6 days. Test/retest correlation coefficients ranged from .70 to .86. Hence, the ENVIRONMENTAL ORIENTATIONS measured on the two scales are considered fairly stable over the time interval employed.

Taken together, these field test results show "Our World of Today" and "Our World of Tomorrow" provide a highly reliable (in terms of internal consistency) and acceptably stable estimate of two ENVIRONMENTAL ORIENTATIONS, towards the "World of Today" and towards the "World of Tomorrow".

*In this study, the internal consistency (Hoyt) estimate for each individual class tested was reported by group, along with the total reliability for each grade. As Harris (1968) states, just reporting a pooled reliability for all subjects (a common procedure in educational research) allows a researcher to overlook a few poor reliabilities on one or more of the sub-groups tested. The pooled reliability, moreover, is often an "inflated" value, unrepresentative of the range of groups tested.

Table 12

Means, Standard Deviations,

Hoyt Reliabilities and Group Sizes: Field Test

Grade 5

"Our World of Today"

Group	Community	$\bar{X}$	σ	r	N
02	Urban	28.5	7.2	.87	27
03	Urban	28.6	6.5	.83	31
04	Urban	40.1	11.1	.91	30
08	Urban	24.8	9.8	.94	30
09	Suburban	29.2	6.7	.81	98
11	Rural	32.6	6.3	.82	34
12	Rural	29.8	7.0	.85	72
15	Rural	39.4	7.4	.90	24
TOTAL	Across Community	30.8	8.6	.89	346

"Our World of Tomorrow"

Group	Community	$\bar{X}$	σ	r	N
02	Urban	34.4	9.1	.93	27
03	Urban	39.7	10.0	.95	31
04	Urban	38.2	14.0	.97	30
08	Urban	33.7	13.4	.97	30
09	Suburban	35.7	12.0	.96	98
11	Rural	35.9	9.1	.94	34
12	Rural	34.6	11.8	.97	72
15	Rural	35.7	11.2	.96	24
TOTAL	Across Community	35.8	11.6	.96	346

Table 13

Means, Standard Deviations,

Hoyt Reliabilities and Group Sizes: Field Test

Grade 8

"Our World of Today"

Group	Community	$\bar{X}$	σ	r	N
01	Urban	26.8	8.6	.92	20
05	Urban	29.1	7.4	.87	16
06	Urban	31.3	5.8	.82	28
07	Urban	26.3	6.4	.83	30
10	Suburban	30.5	6.6	.85	102
13	Rural	32.3	6.3	.86	102
14	Rural	30.3	10.3	.95	21
TOTAL	Across Community	30.4	7.1	.88	319

"Our World of Tomorrow"

Group	Community	$\bar{X}$	σ	r	N
01	Urban	32.8	12.4	.98	20
05	Urban	33.1	11.4	.95	16
06	Urban	30.6	10.3	.95	28
07	Urban	28.1	12.0	.97	30
10	Suburban	29.1	12.5	.98	102
13	Rural	29.1	9.9	.94	102
14	Rural	21.4	8.9	.95	21
TOTAL	Across Community	26.1	11.4	.96	319

Table 14

Factor Loadings for Field Test Results

"Our World of Today/Tomorrow"

(N = 665)

Word Pairs	"World Today"	"World Tomorrow"
pretty/ugly	.752	.884
neat/littered	.684	.873
good/bad	.750	.882
sweet-smelling/stinking	.753	.879
pleasant/unpleasant	.669	.887
sunny/hazy	.557	.831
healthful/sickening	.711	.874
nice/awful	.807	.895
clean/dirty	.744	.907
safe/dangerous	.635	.833
% of Total Variance	50.3	76.4

Table 15

Means, Standard Deviations, and Test/Retest Correlations for Field Test

ENVIRONMENTAL ORIENTATIONS INVENTORY

Retest Group		"World Today"		"World Tomorrow"		"Some Ideas I Have"		The Environmental Decision Inventory		Time Interval
Grade 8	$\bar{X}, \bar{Y}$	30.1	30.3	32.8	32.8	87.7	87.5	156.8	156.0	6 days
Suburban	σ	6.6	7.7	12.3	12.5	8.4	10.4	16.6	17.6	
N = 17[z]	r	.82		.73		.70		.85		
Grade 5	$\bar{X}, \bar{Y}$							149.5	153.1	6 days
Suburban	σ							18.3	17.0	
N = 25	r							.72		
Grade 8	$\bar{X}, \bar{Y}$	33.2	33.9	30.1	29.4	83.1	84.2			4 days
Rural	σ	4.8	5.8	3.4	5.5	9.0	7.3			
N = 18	r	.86		.81		.85				
Grade 5	$\bar{X}, \bar{Y}$	33.0	32.2	33.4	36.4	80.1	79.6			5 days
Rural	σ	6.1	6.7	9.6	13.6	11.1	9.0			
N = 13	r	.70		.82		.61				
Grade 5	$\bar{X}, \bar{Y}$							157.4	157.6	5 days
Rural	σ							10.8	9.9	
N = 17	r							.73		

* Random selection from total group.

z-Two separate 17 member groups. One group took "World Today/Tomorrow" and "Some Ideas". Second group took the EDI.

Likert Scale

The item statistics for the three "new" items included in the field test of "Some Ideas" are shown in Table 16. Two of the three items were poor discriminators or skewed in their response distributions. For example, the range of r biserial correlations for the five response positions to "Protesting about pollution helps to make things better" was +.05 to -.04. The second item, "Too much noise is really a problem to worry about," had a skewed response distribution, low variance and weak negative response correlations. Thus, they were dropped from the analysis.

The third "new" item, "Usually it is best to write on just one side of a piece of paper," fared better. There was adequate distribution of responses and discrimination. The mid-range mean (3.73) and good variance (1.47) completed the statistical good news. This item was included in the analysis.

Thus, for analysis purposes, the field test version of "Some Ideas" contained 25 items and eight distractors. The item statistics for these 25 statements on "environment and pollution" are reported in Appendix L. Items characteristics generally improved over the pilot test. The scalability of items (a "smooth" RAVE weighting in one direction across the response categories) was better, largely a function of a larger N, however. Some of the RAVE weights on pilot test items were computed on very small N. This produced less reliable weighting. In contrast, RAVE weights on the field test items were based on an adequate number of students (over 15) choosing each response position.

Overall, only one item performed less well on the field test than the pilot. Item 25 (building a playground in a marsh) had a better mean, variance and response distribution in the pilot.

Three groups were used to obtain 4-6 day stability estimates for "Some Ideas" (Table 15). The range from .61 (rural fifth grade) to .85 (rural eighth grade) over this period supported the contention of adequate stability of the underlying ENVIRONMENTAL ORIENTATION towards "pollution and the environment."

Internal consistency estimates were obtained for all Grade 5 and Grade 8 groups tested on "Some Ideas" (Table 17). The Hoyt r's ranged from .50 to .74 for fifth graders with an overall r of .73.

An anomaly appeared in the eighth grade computations. Hoyt reliabilities for all eighth grade groups were $\geq$ .68 (overall r=.74), except for one group of sixteen inner city black students (r=.19). This group could NOT be included in the final analyses because they did not meet the minimum reliability criterion of .50. The pattern of responses on "Some Ideas" for this Black eighth grade group, together with another inner city Black fifth grade class nearby produced an interesting picture of the ENVIRONMENTAL ORIENTATIONS of these ghetto youth. While the Black

Table 16

Characteristics of New Items Included in "Some Ideas I Have"

Field Test

(N = 661)

Item		Item Response SA	A	NS	D	SD	Mean	Variance	Decision
7. Protesting about pollution helps to make things better.	N	103	110	174	153	119	3.12	1.76	Omit Weak correlations Poor discrimination
	RAVE wts.	4	4	4	5	6			
	r biser.	.05	.02	-.04	.03	.00			
12. Too much noise is really a problem to worry about.	N	123	223	205	85	23	2.49	1.08	Omit Skewed response distribution Weak correlations
	RAVE wts.	6	5	3	3	5			
	r biser.	.26	.12	-.19	-.14	-.10			
13. Usually, it is best to write on just one side of a piece of paper.	N	50	67	105	234	205	3.73	1.47	RETAIN
	RAVE wts.	2	2	3	4	7			
	r biser.	-.26	-.22	-.14	-.09	.44			

Table 17

Means, Standard Deviations,

Hoyt Reliabilities and Group Sizes: Field Test

"Some Ideas I Have"

Grade 5

Group	Community	$\bar{X}$	σ	r	N
02	Urban	80.7	9.1	.62	27
03	Urban	78.8	11.0	.65	29
04	Urban	70.2	9.2	.50	30
08	Urban	94.4	11.9	.74	30
09	Suburban	82.2	10.2	.64	98
11	Rural	82.4	10.0	.66	34
12	Rural	87.6	11.0	.69	72
15	Rural	79.1	11.4	.74	24
TOTAL	Across Community	82.7	11.9	.73	344

Grade 8

Group	Community	$\bar{X}$	σ	r	N
01	Urban	83.2	11.6	.80	20
05	Urban	72.9	6.6	.19	16
06	Urban	87.3	10.4	.75	28
07	Urban	88.0	10.9	.78	28
10	Suburban	87.3	9.6	.68	103
13	Rural	84.7	10.7	.74	102
14	Rural	89.3	10.9	.76	20
TOTAL	Across Community	85.7	10.7	.74	217

eighth graders were not included in the statistical analyses, a qualitative discussion of their responses, together with the fifth grade Blacks, is included as Appendix M, titled "The Black Anomaly".

Table 18 shows the Hoyt reliability estimates for the total fifth and eighth grade groups as well as the combined groups omitting the Black eighth graders (group 05). The internal consistency of the instrument is virtually the same at both grade levels (.73; .74), exceeding the minimum reliability criterion. Thus "Some Ideas" is an acceptably reliable instrument to measure an EO towards "environment and pollution" for both grades.

Table 18

Means, Standard Deviations

Hoyt Reliabilities and Group Sizes: Field Test*

"Some Ideas I Have"

Grade	$\bar{X}$	σ	r	N
5	82.7	11.9	.73	344
8	86.4	10.4	.73	301
TOTALS	84.4	11.4	.73	645

*Grade 5 and Grade 8 Urban Blacks omitted.

Factor Analysis of the Likert Scale

A factor analysis of 645 students' responses on "Some Ideas" produced seven factors. The first four, accounting for 33.8% of the total variance, were interpretable as ENVIRONMENTAL ORIENTATIONS which "contributed" to the overall EO toward "environment and pollution." Sixteen of the 25 items on the total instrument appeared in these "contributing" EOs. The identified EOs were:

Use/abuse of Nature
Overpopulation
General Environmental Concern
Eco-responsible Behavior

The items comprising each Likert-based ENVIRONMENTAL ORIENTATION, with their respective reliability estimates and factor loadings are presented in Table 19. The items included in a "contributing" EO loaded at greater than .40 on that factor, and each ENVIRONMENTAL ORIENTATION included only items with an average reliability in excess of .60. Reliability and selection criteria set up for this study were met for the Likert instrument.

Table 19

Factor Loadings and Reliabilities of Items

Included in ENVIRONMENTAL ORIENTATIONS from "Some Ideas"

ENVIRONMENTAL ORIENTATION	Factor Loading	Item	Item Reliability*
USE/ABUSE OF NATURE (Factor 1)	.67	25. If my dad owned a marsh or woods where some animals lived, I would like part of it made into a playground (like at school).	.67
	.63	31. We have enough parks and forests now for wild animals to live in.	.65
	.62	22. If wild animals need a safe home, it would be best to put them in a nice zoo.	.66
	.61	32. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.	.66
OVER POPULATION (Factor 2)	.70	4. From now on, people getting married should have no more than two children.[2]	.75
	.67	10. The cause of many problems in the world today is too many people.[2]	.72
	.66	6. [illegible]on there may be too many people living on the earth.[2]	.74
	.64	24. Parents should have as many children as they want.	.80
	.50	35. It is O.K. for the number of people living in our country to increase. (This means more people would live here.)	.66
GENERAL ENVIRONMENTAL CONCERN (Factor 3)	.60	3. I worry about the environment (problems like pollution).[2]	.63
	.60	29. Motorbikes and motorcycles should by made more quiet.[2]	.63
	.44	27. There is too much on T.V. about problems with pollution.	.64
	.42	16. I think there are a lot of pollution problems I can help stop.[2]	.51

Table 19 (cont.)

Factor Loadings and Reliabilities of Items

Included in ENVIRONMENTAL ORIENTATIONS from "Some Ideas"

ENVIRONMENTAL ORIENTATION	Factor Loading	Item	Item Reliability*
ECO-RESPONSIBLE BEHAVIOR (Factor 4)	.64	23. Milk at school should come in bottles that can be used over, not paper cartons.[2]	.69
	.59	17. Soda pop should be sold only in bottles that can be used again, not in cans.[2]	.70
	.52	8. If a person's car makes too much air pollution, he should not be allowed to drive it.[2]	.56

*Reliabilities estimated from item communalities on rotated factor matrix.

[2]Response reversed for scoring purposes.

The Environmental Decision Inventory

Several estimates of reliability were obtained for the field test version of the EDI. These included an internal consistency check (Hoyt reliability) on the "Action-Orientation" subscale, and a stability estimate for the total EDI (test/retest correlation).

Table 20 lists the internal consistency estimates of the "Action-Orientation" scale for the two grades tested. This scale (described in Chapter Three) represented the ORIENTATION a person has towards being able to help solve environmental problems. The overall Hoyt reliability of this scale for the group of 536 fifth and eighth graders* included in the EDI analysis was .78; higher for fifth graders than eighth graders (.79 vs. .76). These reliability estimates supported the use of this subscale to measure students "Action-Orientations".

Table 20

Means, Standard Deviations,

Hoyt Reliabilities and Group Sizes: Field Test

"Action-Orientation" Scale

The Environmental Decision Inventory

Grade	$\bar{X}$	σ	r	N
5	6.0	3.2	.79	271
8	5.8	3.0	.76	265
TOTALS	5.9	3.1	.78	536

Table 15 (p. 62) includes the EDI stability estimates obtained with three different groups participating in the field test. One eighth grade group, and two fifth grade groups were retested on the EDI 5-6 days after the initial administration. The test/retest correlation coefficients ranged from .72 to .85. The ENVIRONMENTAL ORIENTATIONS contained in the EDI appeared stable over this time period.

*As mentioned previously, we used a randomly selected sub-sample of suburban students on the EDI. The EDI total sample reported here reflects this decision. All other student groups participating (both rural and urban) received all three instruments in the EDI.

EOs Derived From the EDI

Twelve factors evolved from factor analyzing the EDI responses. Six of these 12 accounted for 45.0 percent of the total variance and included 25 of the total 41 "solutions to environmental problems." They were interpreted as EOs concerning:

Personal Concern
Eco-Insensitivity
Population Control
Environmental Protection
Technology
Action Towards Nature

Each EO included three to six items. Two EOs contained items drawn from single stories (the Action Towards Nature EO from "The School Tree" story and the Population Control EO from the "Freeland" story). The four remaining EOs included items drawn from several EDI stories. Reliabilities for these EOs were adequate. The items included in the six ENVIRONMENTAL ORIENTATIONS, together with their factor loadings and reliabilities are presented in Table 21.

Table 21

Factor Loadings and Reliabilities of Items Included in

ENVIRONMENTAL ORIENTATIONS from the Environmental Decision Inventory

ENVIRONMENTAL ORIENTATION	Factor Loading	Item	Item Reliability*
PERSONAL CONCERN (Factor 1)	.59	24. Put the mill away from the water. Dump stuff somewhere else.	.67
	.58	28. The best way to solve the problem is for Jo Lynn's family to move away, or her mother to get another job.	.68
	.58	45. The best thing to do is for Donna's father to get another job, or the family move away.	.70
	.56	12. The most important thing in this story is for the Jackson family to decide whether to go camping or not.	.62
	.55	3. Newtown has enough parks now for people to relax in. Use the land for something else.	.58
ECO-INSENSITIVITY (Factor 2)	.66	49. People should be able to get soda pop in cans or bottles. Then you can buy what you want.	.71
	.57	48. The best way to solve the problem is to stop throwing trash around. Put it in garbage cans.	.67
	.51	43. Keep the factory open. Jobs are more important than a little air pollution.	.66
	.61	41. Watch out for animals, but it is O.K. to clear-cut. We need lumber that costs less.	.64
	.49	32. This is not really a problem. There is plenty of land outside cities for people to live on.	.66
POPULATION CONTROL (Factor 3)	.79	34. Start a program to get parents to have smaller families.	.81
	.78	37. Pass a law to make parents have fewer children.	.80
	.51	36. Stop people from coming to Free-land. Let some move away.	.65

Table 21 (cont.)

Factor Loadings and Reliabilities of Items Included in

ENVIRONMENTAL ORIENTATIONS from the Environmental Decision Inventory

ENVIRONMENTAL ORIENTATION	Factor Loading	Item	Item Reliability*
ENVIRONMENTAL PROTECTION (Factor 4)	.46	2. Don't use the land for another highway. There are enough roads now.	.56
	.66	17. Stop all the strip mining. It ruins the land. Use tunnel mines instead.	.70
	.54	40. Stop the clear-cutting. It ruins too many things. Get lumber some other way.	.63
	.48	20. The most important reason to stop strip mining is to save animal's homes.	.59
	.45	29. Shut down the factory to stop the pollution.	.65
	-.43	19. Keep strip mines. We need the coal from them. They are safer than tunnel mines.[z]	.72
TECHNOLOGY (Factor 5)	.74	44. Put a filter on the chimney to stop the smoke.	.76
	.71	23. Put in a filter to stop the pollution.	.72
	.67	27. Get a machine which keeps dirt out of the air.	.68
ACTION TOWARDS NATURE (Factor 6)	.71	9. Move the tree someplace else. This will make more room for cars and children.	.73
	.57	6. Cut the tree down before someone gets hurt.	.72
	-.65	7. Don't[z] do anything. Leave the tree alone.	.72

*Reliabilities estimated from item communalities on rotated factor matrix.

[z]Response reversed for scoring purposes.

CHAPTER V

CONCLUSIONS

General Discussion

The major purpose of this project was to develop valid and reliable instruments for use in research, development and evaluation activities associated with environmental education. An analysis of related research had indicated that such instrumentation was in short supply and that there was little, if any, utilization of common measures for data gathering. Consequently, each reported study was sufficiently diverse from every other that the summative results contributed but little to understanding a comprehensive whole.

Equally as important was the establishment of a framework for focusing this instrument development activity and future research and development work. An inadequacy in previous efforts, revealed by the literature survey and the research review, was the absence of a comprehensive conceptual framework for studying orientations toward the environment. Approximations of any such idealized framework were so diverse that it was extremely difficult to determine whether individual studies complemented each other or whether they were in conflict. It was contended that a comprehensive whole derived from a global philosophy of environmental education should be the starting point for research and development rather than one or more of the possible subsets, with the expectation that at some future time the pieces would be interrelated to give us a handle on the big picture. An examination of the system should reveal some threads which pervade the subsystems. We wanted an understanding of these subsystems and their relationships to the system and other subsystems to evolve from an attack on the whole.

Recall from earlier discussion that a major concern about activities in environmental education, particularly the quantity and quality of research, was that these activities were being pursued from a reductionist viewpoint. It was our judgment that initially this approach would be less fruitful than approaching environmental education research from an integrationist perspective. The term "environmental orientations" was selected to represent this perspective. An environmental orientation was defined as a disposition toward an environmental situation which reflected a composite of various inputs – experiences, cognitive understanding and affective considerations. All these inputs were judged to interact in a highly complex fashion and interact differentially as a function of the individual's degree of sophistication in each input area and the particular operational context. If a person approaches an environmental situation (problem, etc.) as a whole,

and then "attacks" its specific parts, instrument development should be approached from a perspective consistent with this way of viewing things.

With a conceptual framework based on environmental orientations, there would be a workable way to study the totality of man-environment interactions. By starting with the whole and assessing the individual's responses, we would receive cues as to how to step down to specifics. An individual's environmental orientations were seen as derivatives of a set of several things whose interactions would vary as the situation varied. Working with the same set of inputs — knowledge, experience, etc., the individual might respond differently to general situations than to more specific situations and, in fact, as specificity increased the nature of the response would be more apt to change. Attempts to divide something complex into subelements would be delayed until we had a better grasp of the whole. Something as integrally related as the individual's affective and cognitive sets, when responding to the environment, would not be reduced until clues to what the smaller pieces might be evolved from examination of the total.

The above position about how to approach EE research were supported by the review of related research. It was found that people's reactions to their environment(s) are influenced by many things including conceptual knowledge, beliefs, values, socio-economic status, and I.Q. In order to further study how these and other variables might affect an individual's orientation toward his environment(s), instruments should be prepared which could be used to assess what these orientations are, and how these orientations vary with situational specificity. The research review also revealed conflicting results. In part, this appeared to be an absence of a "common" conceptual framework, but there was also little use of common instrumentation.

Results of this investigation lend credibility to the decision to approach environmental orientations in terms of a complex whole. It was found that the more global the situation, the more apt there was to be agreement between groups as to the nature of these orientations. But as the environmental situation became more specific, as with orientations toward "environment and pollution" or even more specific as in the Environmental Decision Inventory, there was increasing diversity in the nature of responses. This was borne out by the factor analyses. Our World of Today and Our World of Tomorrow were both unifactorial. "Some Ideas" exhibited seven factors (four interpreted) and with the specificity in the Environmental Decisions Inventory there were even more factors, a total of 12 (six interpreted). This provides support for the premise of approaching environmental orientations from the broad perspective and <u>then</u> seeking interpretable components. These results

indicate that researchers working from the reductionist perspective are probably dealing with potential contributors to environmental orientations, but they would be well advised to examine their postulations in terms of a more inclusive conceptual framework.

In addition to increasing the credibility of an holistic approach to environmental education research, an instrument battery has been produced for measuring general orientations to the environment, orientations to pollution related problems, and orientations to even more specific environmental problems such as population. The instruments were shown to be valid, reliable, and acceptably stable within reasonable time limits. We recognize that something as complex as an environmental orientation, influenced by so many factors and their interactions, is likely to go through continuous change, often over short time periods. And working with elementary and middle school children , who are constantly formulating ideas and gathering input to solidify or verify the ideas, leads to anticipation of many and varied changes. In any event, the instruments in the Environmental Orientations Inventory have exhibited properties that make them useful and usable in determining the nature, direction, and magnitude of these changes.

In addition to establishing the validity, reliability, and stability of the instruments the battery was constructed to allow use by researchers, program evaluators, and classroom teachers. Responses are easily machine scoreable and the reasonable administration time enhances their usability. Further, the instrument formats permit gathering of general and/or specific kinds of information. The instruments will give a range of orientations from general to specific, as indicators of how conceptual knowledge, experiences, and affective considerations are "mixing" to affect environmental orientations.

Even though the investigation and development were initiated from an integrationist perspective, the factor analyses demonstrate that it may be possible to evolve a set of general environmental orientations into subsets. This should give those seeking information about beliefs, values, or attitudes new encouragement. Although as indicated previously, it is recommended that they refine and expand their view of the dimensions of environmental education. By converging on the problem from both directions, but always with the narrower perspective responsible and responsive to the whole, we should be able to identify some of the major elements of environmental orientations. And through continued research determine those elements which might contribute "most" to the various orientations. We would hope to identify a manageable group of factors which can be used to predict.

At this time the amount of research and the somewhat vague conceptual basis for conducting research is too limited to make absolute statements about the dimensions of environmental orienta-

tions. However, some of the sub-scales identified can be used for making comparisons between and among groups. And the analyses performed identifying these sub-scales demonstrated that some items produce worthwhile information and others do not. But, it is clear that environmental orientations have sub-elements which themselves can be bases for continued research. The instruments prepared here can help refine and clarify such research activity and simultaneously be used to make initial assessments about program effectiveness and changes undergone by program participants.

Findings of Note

It was not the intent of this project to engage in extensive statistical comparisons. However, certain analyses performed in determining the psychometric characteristics of the instrument battery yielded some findings of note. Grade level, IQ, socio-economic status, community, and sex ALL had some influence on environmental orientations. But these factors influenced orientations differentially. For example, socio-economic status appears to be a pervading factor in terms of general environmental concerns. But as the environmental orientation is in response to something increasingly specific the influence of SES lessens. If this pattern holds consistently, research on environmental orientations must exercise utmost care with the context and the specificity of the situation to which responses are elicited. Factors which influence responses to general situations may be inconsequential when dealing with a highly specific problem. Examination of the data indicated that the higher an individual's SES the more apt he was to be concerned about overall environmental quality. But when confronted with a specific problem which might affect him, his friends, or his family that degree of concern lessens rapidly in comparison to other factors. This is but another reminder to researchers and evaluators of the danger of making global statements about the influences on an individual's environmental orientations.

Another finding of note was that the Black students responding to the instruments did not perceive themselves as contributing to overpopulation or utilizing "goods" which need recycling. Thus they did not accept personal responsibility for the alleviation of pollution and its causes. This area needs to be explored in depth. The results caution us to use discretion in the choice of instruments for gathering judgmental data.

Of further interest was the finding that children's optimism tends to decrease as they grow older. This might be a normal developmental characteristic but it could also be attributed to the child's growing knowledge of the complexity of environmental problems. The older child may also be more receptive to inputs, suggestions, and pressures exerted by teachers, parents, peers, community personnel, and the mass media. If a child entering

adolescence is already exhibiting pessimism about chances for his survival and that of the environment, it lessens the probability of developing a citizenry which will take the necessary actions to preserve what is left of our environment. We might caution doomsday proponents to use discretion in approaching the environmental problem. They should not be any less concerned about environmental quality, but we suspect that increased payoff would come from showing alerted people what positive actions they can take as a function of their experience, age, etc., rather than bombarding them with messages about the fruitlessness of their activities.

We have produced some useful instruments that are valid, reliable, and stable. Our initial goal has been met. As we continue to analyze the data from other perspectives, we will report the results through appropriate communications media so that the total value of our data base is not lost to the rest of the environmental education community.

BIBLIOGRAPHY

Abram, Robert E. and Rosinger, George. 1972. "Behavioral Science Applications in Environmental Quality", Journal of Environmental Education 4(1):1-6.

American Psychological Association. 1954. Technical Recommendations For Psychological Tests and Diagnostic Techniques. American Psychological Association.

Anastasi, Anne. 1961. Psychological Testing. MacMillan, New York.

Armstrong, R. J., et.al. 1970. The Development and Evaluation of Behavioral Objectives. Charles A. Jones, Worthington, Ohio.

Baker, Frank B. 1969. FORTAP, A FORTRAN Test Analysis Package. Laboratory of Experimental Design, University of Wisconsin, Madison.

Barnett, Larry D. 1970. "Concern with Environmental Deterioration and Attitudes Toward Population Limitation", Bioscience 20(18):999-1003.

Bart, William M. 1972. "A Hierarchy Among Attitudes Toward The Environment", Journal of Environmental Education 4(1):10-14.

Burchett, Betty. 1971. "A Descriptive Study of Fourth, Fifth, and Sixth Grade Students' Attitudes Relative to Environmental Problems". Ed.D. thesis, Indiana University.

Campbell, Donald T. and Stanley, Julian C. 1966. Experimental and Quasi-Experimental Designs For Research. Rand McNally, Chicago.

Chafee, Steven H., Carter, Richard F., and Ruggels, W. Lee. 1969. "The Semantic Differential in Opinion Measurement", Public Opinion Quarterly 32:666-674.

Chaney, Edward. 1970. "The Environment: Who Cares? Why? So What?", Journal of Environmental Education 1(3):80-82.

Cohen, Arthur. 1964. Attitude Change and Social Influence. Basic Books, New York.

Commoner, Barry. 1969. "Evaluating the Biosphere", Science Journal 5A(4):67-72.

_____. 1971. The Closing Circle. Alfred A. Knopf, New York.

Constantini, E. and Hanf, K. 1972. "Environmental Concern and Lake Tahoe: A Study of Elite Perceptions, Backgrounds and Attitudes", Environment and Behavior 4(2):209-242.

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Craik, Kenneth. 1969. "The Environmental Dispositions of Environmental Decision-Makers", Journal of American Academy of Political and Social Science 380:87-94.

Cronbach, Lee J. 1960. Essentials of Psychological Testing. 2nd ed., Harper & Brothers, New York.

Davidson, Morris. 1965. "Changes in Self-Concepts and Sociometric Status of Fifth and Sixth Grade Children as a Result of Two Different School Camp Curricula". Ph.D. thesis, University of California.

DeGroot, Ido; Loring, William; Rihm, Alexander, Jr., Samuels, Sheldon; and Winklestein, Warren, Jr. 1966. "People and Air Pollution: A Study of Attitudes in Buffalo, N.Y.", Journal of the Air Pollution Control Association 16(5):245-247.

Donaldson, George W. 1972. "Research in Outdoor Education", Journal of Environmental Education 3(4):9-10.

Donnelly, Rose Ann Garone. 1957. "A Study of the Conservation Ideas of 282 Urban Children". Ed.D. thesis, Teachers College, Columbia University.

Dubos, Rene. 1966. "Man and His Environment: Scope, Impact, and Nature", in Environmental Improvement (Air, Water, and Soil). Ed. Ralph W. Marquis, U.S.D.A., Washington, D.C.

Edwards, Alba E. 1943. Comparative Occupational Statistics for the United States, 16th Census, 1940. U.S. Government Printing House, Washington, D.C.

Edwards, Allen L. 1957. Techniques of Attitude Scale Construction. Appleton-Century-Crofts, New York.

_____. 1970. The Measurement of Personality Traits by Scales and Inventories. Holt, Rinehart, and Winston, New York.

Fishbein, Martin. 1963. "An Investigation of the Relationship between Beliefs About an Object and the Attitude Toward That Object", Human Relations 16:233-240.

Fry, Edward. 1968. "A Readability Formula That Saves Time", Journal of Reading April, 1968:513-516.

Gallagher, James J. 1972. "A Summary of Research in Science Education For the Years 1968-1969: Elementary School Level", Journal of Research In Science Teaching 9(1):19-46.

George, Robert Worth. 1966. "A Comparative Analysis of the Conservation Attitudes in Situations Where Conservation Education is a Part of the Educational Experience". Ph.D. thesis, Michigan State University.

Gillenwater, Mac. 1969. "Outdoor Education: A Coat of Many Colors", Peabody Journal of Education 46:311-315.

Glassrow, Ruth B. and Broer, Marion R. 1938. Measuring Achievement In Physical Education. W. B. Saunders, Philadelphia.

Guertin, Wilson H., and Bailey, John P. Jr., 1970. Introduction To Modern Factor Analysis. Edwards Brothers, Inc., Ann Arbor, Michigan.

Gulliksen, Harold. 1950. Theory of Mental Tests. John Wiley, New York.

Harman, Harry H. 1967. Modern Factor Analysis. 2nd. Ed., University of Chicago Press, Chicago, Illinois.

Harris, Margaret L. 1968. Some Methodological Suggestions For Construction of An Objective Measurement Instrument. Technical Memo M-1968-2, UW Research and Development Center for Cognitive Learning, Madison, Wisconsin.

Hays, William L. 1963. Statistics For Psychologists. Holt, Rinehart, and Winston, New York.

Hess, Robert D. and Torney, Judith V. 1967. The Development of Political Attitudes In Children. Anchor Books, Doubleday, New York.

Hine, Virginia and Gerlach, Luther P. 1970. "Many Concerned, Few Committed", Natural History LXXIX (10):16-17, 76-80.

Hodges, Harold M. 1964. Social Stratification: Class In America. Schenkman Publishing Co., Cambridge, Mass.

Hoover, Kenneth H. and Schutz, Richard E. 1963. "Conservation Attitudes of Science Majors as Compared with Those of Non-Science Majors", Journal of Research in Science Teaching 2(2):108-110.

Hoyt, Cyril. 1941. "Test Reliability Estimated By Analysis of Variance", Psychometrika 6:153-160.

Isaac, Stephen and Michael, William B. 1971. Handbook In Research And Evaluation. Robert R. Knapps, San Diego, California.

Jackman, W. L. 1891. Nature Study For the Common Schools. Holt, New York.

Kahl, Joseph A. and Davis, James A. 1955. "A Comparison of Indexes of Socioeconomic Status", American Sociological Review 20:317-325.

Kerlinger, Fred N. 1965. Foundations of Behavioral Research. Holt, Rinehart & Winston, New York.

Knapp, Clifford E. 1972. "Attitudes and Values in Environmental Education", Journal of Environmental Education 1(3):65-74.

Krathwohl, D., Bloom, B., and Masia, B. 1964. Taxonomy of Educational Objectives Handbook II: Affective Domain. David McKay, New York.

Krech, D., Crutchfield, R., and Ballachey, I. 1962. The Individual in Society. McGraw Hill, New York.

Ladd, Florence C. 1970. "Black Youths View Their Environment", Environment and Behavior 2(1):74-99.

Laug, George. 1960. "A Study of Expressed Attitudes of Prospective Teachers Taking Part in Practical Conservation Activities", Ph.D. thesis, Syracuse University.

Leopold, Aldo. 1949. A Sand County Almanac. Oxford University Press, New York.

Lord, Frederic M., and Novick, Melvin R. 1968. Statistical Theories of Mental Tests. John Wiley, New York.

McKechnie, George E. 1969. "The Environmental Response Inventory: Preliminary Development". Report from the Institute of Personality Assessment and Research, Univ. of California, Berkeley.

Marsh, George Perkins. (Original publication, 1864) 1965. Man and Nature, Ed. David Lowenthal. Harvard Univ. Press, Cambridge, Massachusetts.

Maurer, Robert and Baxter, James C. 1972. "Images of the Neighborhood and City Among Black-, Anglo-, and Mexican-American Children", Environment and Behavior 4(4):351-388.

Medalia, N. and Finkner, A. 1965. "Community Perception of Air Quality: An Opinion Study in Clarkston, Washington". U.S. Public Health Service Publication 999-10, Cincinnati, Ohio.

Mitchell, Sandra K. and Lanneborg, Patricia W. 1973. "Effects of Environmental Education On First Graders", Journal of Environmental Education 4(4):34-37.

National Education Association Research Division. 1970. "A Survey of School Environmental Programs", Today's Education 58:19-21.

Nicholson, Max. 1970. Man's Use of the Earth. McGraw Hill, New York.

North, Cecil C. and Hatt, Paul K. 1947. "Jobs and Occupations: A Popular Evaluation", Public Opinion News 9:3-13.

Nunnally, J. 1961. Popular Conceptions of Mental Health. Holt, Rinehart & Winston, New York.

Osgood, C. E., Suci, J. and Tannenbaum, P. 1957. The Measurement of Meaning. University of Illinois Press, Urbana.

Perrodin, A. F. 1966. "Children's Attitudes Towards the Elementary Science Curriculum", Science Education 50:214-218.

Perry, Bradford George. 1972. "A Study of Selected Factors Associated With Environmental Attitudes of Big Stone Lake Area Residents". Ph.D. thesis, South Dakota State University.

President's Council on Environmental Quality. 1970. Environmental Quality: The First Annual Report of the Council on Environmental Quality. U.S. Government Printing Office, Washington, D.C.

Rankin, Robert E. 1969. "Air Pollution and Public Apathy", Journal of the Air Pollution Control Association 9(8):565-569.

Rokeach, Milton. 1968. "The Role of Values in Public Opinion Research", Public Opinion Quarterly 32:547-559.

_____. 1970. Beliefs, Attitudes and Values. Jossey-Bass, San Francisco, California.

_____. 1971. "Long Range Experimental Modification of Values, Attitudes, and Behavior", American Psychologist 26(5):453-459.

Ronfeldt, Leo L. 1969. "A Determination of Basic Urban Environmental Understanding Important for Inclusion in the Elementary School Curriculum". Ph.D. thesis, University of South Dakota.

Rowland, G. W. 1968. "Sex Differences in Science Background of Elementary School Children", Science Education 54:179-180.

Roth, Robert E. 1970. "Fundamental Concepts For Environmental Management Education", Journal of Environmental Education 1(3):65-74.

_____ and Helgeson, S. L. 1972. A Review of Research Related to Environmental Education. ERIC Information Analysis Center for Science, Mathematics, and Environmental Education, Ohio State University, Columbus.

Rupff, Paul Ernest. 1957. "A Comparison of Aspirations With Achievements in a Group of Selected Michigan Public School Camps". Ph.D. thesis, Michigan State University.

Schoenfeld, Clay. 1970. "Toward A National Strategy for Environmental Education", Journal of Educational Research 64(1):5-11.

Selltig, Claire, Jaboda, Marie, Duetsch, Morton, and Cook, Stuart W. 1959. Research Methods in Social Relations. Holt, Rinehart and Winston, New York.

Sherman, Robert C. 1950. "The Conservation Attitudes and Information Possessed by Elementary School Teachers in Training", Ph.D. thesis, University of Missouri.

Shrigley, R. L. 1972. "Sex Differences and Its Implications For Attitudes and Achievement in Elementary School Science", School Science and Mathematics 72(9):789-793.

Stack, Genevieve C. 1960. "An Evaluation of Attitudinal Outcomes of Fifth and Sixth Grade Students Following a Period of School Camping". Ph.D. thesis, University of Oklahoma.

Stamm, Keith R. and Bowes, John E. 1972. "Environmental Attitudes and Reaction", Journal of Environmental Education 3(3):56-60.

Steiner, Robert L. 1971. "A Factor Analytic Study of the Attitudes of Oregon High School Seniors Toward Socially Significant Science Related Issues", paper presented to the annual meeting of the National Association for Research in Science Teaching, March 25, 1971.

Swan, James. 1967. "An Analysis of Attitudes and Coping Strategies of High School Youth: Response to Air Pollution". Ph.D. thesis, University of Michigan.

Terman, L. M. and Tyler, L. E. 1954. "Psychological Sex Differences", in Manual of Child Psychology, Ed. L: Carmichael. 2nd Edition, John Wiley, New York.

Thorndike, Robert L. 1951. "Reliability" in Educational Measurement, Ed. E. F. Lindquist, American Council on Education, Washington, D.C.

Tognacci, Louis N.; Weigel, Russell H.; Wideen, Marvin F.; and Vernon, David T. A. 1972. "Environmental Quality: How Universal is Public Concern?", Environment and Behavior 4(1):73-86.

Towler, John and Swan, James E. 1972. "What Do People Really Know About Pollution?" Journal of Environmental Education 4(1):54-57.

Trexler, Clarence R. 1963. "A Study of the Relationship Between the Recorded and the Observed Conservation Behavior of Children in an Urban Classroom", Science Education 47(2):144-156.

United States Office of Education, Department of Health, Education and Welfare. 1971. A Review of Environmental Education For School Administrators. National Center for Educational Research and Development, Columbus, Ohio.

_____. 1973. Environmental Education Handbook. U.S. Government Printing House, Washington, D.C.

Voelker, Alan M. and Watson, Michael D. 1973. The Status of the Research Base for Environmental Education, Working Paper 86, University of Wisconsin Research and Development Center for Cognitive Learning, Madison, Wisconsin.

Viedermann, Stephan. 1973. "Needed Research in Population Education", Journal of Environmental Education 4(4):51-55.

Webb, Eugene J., Campbell, Donald T., Schwartz, Richard D., and Sechrent, Lee. 1966. Unobtrusive Measures. Rand McNally, Chicago, Illinois.

White, Gilbert. 1966. "The Formation and Role of Public Attitudes" in Environmental Quality in a Growing Economy, Ed. Henry Jarrett. John Hopkins, Boston.

White, Lynn T. Jr., 1967. "The Historical Roots of Our Ecological Crisis", Science 155(3767):1203-1207.

Wicker, Allan W. 1969. "Attitudes Versus Actions: The Relationship of Verbal and Overt Behavioral Responses to Attitude Objects", Journal of Social Issues, XXV(4):41-78.

Wood, Dorothy Adkins. 1960. Test Construction: Development and Interpretation of Achievement Tests. Charles E. Merrill, Columbus, Ohio.

Appendix A

Instructions for Initial Administration of Instruments

Appendix A

INSTRUCTIONS FOR INITIAL ADMINISTRATION OF INSTRUMENTS

MY NAME IS _____, AND I WORK AT THE UNIVERSITY OF WISCONSIN IN MADISON. HOW MANY OF YOU HAVE HEARD OF THE WORD "SURVEY"? DOES ANYONE KNOW WHAT IT MEANS?

(discussion)

A SURVEY IS WHEN YOU GET PEOPLE'S IDEAS AND OPINIONS ABOUT DIFFERENT THINGS.

TODAY WE ARE INCLUDING THIS CLASS IN A SURVEY WE ARE TAKING. WE WANT TO FIND OUT WHAT STUDENTS THINK ABOUT SOME PROBLEMS IN THE WORLD TODAY. YOUR CLASS IS ONE OF MANY FIFTH AND EIGHTH GRADE CLASSES IN WISCONSIN TAKING THIS SURVEY. KNOWING WHAT YOU THINK ABOUT THESE PROBLEMS WILL HELP US PLAN NEW AND MORE INTERESTING THINGS TO DO IN SCHOOL.

THE IMPORTANT THING TO REMEMBER IS THIS IS NOT A TEST. YOU DON'T GET A GRADE ON IT. YOU JUST TELL US WHAT YOU FEEL ABOUT SOME THINGS. THERE ARE NO RIGHT ANSWERS.

THE SURVEY WILL BE IN THREE PARTS. YOU'LL DO EACH PART SEPARATELY. BEFORE WE START, PLEASE FILL OUT THE PINK INFORMATION SHEET, SO WE CAN GET TO KNOW YOU BETTER.

(students complete sheets; student questions answered)

(TODAY, NOW) WE'LL DO THE FIRST TWO PARTS OF THE SURVEY--THE YELLOW AND BLUE PARTS. (AFTER RECESS, LATER) WE'LL DO THE LAST PART OF THE SURVEY. LET'S READ THE INSTRUCTIONS FOR DOING THE FIRST PART OF THE SURVEY (on cover of yellow booklet).

(read directions, etc.)

NOTE: The use of the words "ecology", "environment", or "environmental problem" were omitted from the introduction. All statements remained general. (For example, the EDI was described as containing some stories about different kinds of problems, but they were not called environmental problems.) This procedure was employed to avoid creating an "environmental" response set.

Appendix B

The Most Serious Environmental Problems

Appendix B

THE MOST SERIOUS ENVIRONMENTAL PROBLEMS

[The ten most serious environmental problems facing the world today have been named by 18 internationally known ecologists. This list was compiled for use during the National Wildlife Federation international symposium, "Uniting Nations for Biosurvival", Stockholm, Sweden, June 10-12, 1972.]

1. Too many people, creating impossible demands on all natural resources.

2. Pollution of waters of the world with far-reaching effects on human health, marine and freshwater fisheries, economic and esthetic values.

3. Pollution of the air, with resultant diseases and maladies for man and for animals; as well as pollution of atmosphere as far as damaging noise levels are concerned.

4. Absence of really significant, long-lasting research in food production to feed the hungry peoples of the world.

5. Lack of workable programs to preserve and protect the endangered wildlife species of the world.

6. Inability to limit indiscriminate use of persistent toxic substances affecting vast resources and peoples in all climates and all parts of the world.

7. Inability to recycle effectively, valuable raw materials which will be forever lost to the world's future people.

8. Failure to research and plan for alternative sources of energy to improve living conditions for the world's people.

9. Inability to invest wisely public and private monies that are available to improve the general environment, both physically and esthetically.

10. Inability of nations and the political sub-divisions to develop workable systems of control and cooperation in ecological matters; also difficulty of establishing effective ecological programs.

(From Environmental Education News 3(2):2, November 1972. Wisconsin Department of Public Instruction.)

Appendix C

Instructions for Re-testing of Instruments

Appendix C

INSTRUCTIONS FOR RE-TESTING OF INSTRUMENTS

WHY DO YOU THINK WE'RE ASKING FOR IDEAS OVER AGAIN?

(discussion)

WELL, THE REASON IS THAT ONE IMPORTANT THING FOR US TO KNOW IS WHETHER STUDENTS CHANGE THEIR MINDS ABOUT THESE IDEAS. THE ONLY WAY WE CAN FIND THIS OUT IS TO ASK YOU AGAIN. SINCE WE DIDN'T WANT TO ASK EVERYONE OVER AGAIN, WE PUT ALL THE NAMES OF STUDENTS WHO TOOK THE TESTS THE FIRST TIME IN A HAT. THEN WE DREW OUT YOUR NAMES. SO YOU REPRESENT ALL OF THE (FIFTH, EIGHTH) GRADE.

SOME PEOPLE WILL BE DOING THE YELLOW AND BLUE TESTS AGAIN. OTHERS WILL BE DOING THE GOLD TEST OVER. PLEASE, READ CAREFULLY THE INSTRUCTIONS ON THE TESTS YOU ARE DOING. THE DIRECTIONS WILL HELP YOU REMEMBER HOW TO MARK YOUR IDEAS. JUST BECAUSE YOU'VE DONE THEM ONCE, DON'T SPEED THROUGH THEM. TAKE YOUR TIME. THINK ABOUT EACH IDEA.

MARK THE IDEAS THE WAY YOU FEEL TODAY. THIS CAN BE JUST WHAT YOU SAID BEFORE, OR IT CAN BE DIFFERENT. DON'T TRY AND REMEMBER WHAT YOU SAID BEFORE. JUST SAY WHAT YOU FEEL TODAY--THAT'S THE IMPORTANT THING.

AND REMEMBER, THERE ARE NO RIGHT ANSWERS. YOU CAN TAKE THE WHOLE PERIOD TO FINISH.

YOUR IDEAS ARE VERY IMPORTANT TO US. THANK YOU FOR HELPING US AGAIN. IF YOU HAVE ANY QUESTIONS AS YOU DO THESE TESTS, RAISE YOUR HAND FOR HELP.

YOU CAN START NOW.

Appendix D

The Reciprocal Averages Program (RAVE)

Appendix D

THE RECIPROCAL AVERAGES PROGRAM (RAVE)*

Much of the data obtained from investigations in the social sciences is qualitative in nature, consisting of ratings, expressed likes and dislikes, attitudes, etc. Because of the difficulties in analyzing such data, it is highly desirable to be able to quantify the data. The Method of Reciprocal Averages is a technique whereby one can quantify qualitative data. The mathematical basis for this technique is given in Torgerson (1963), pages 338-345, under the heading of principal components scaling. The procedure employs an *a priori* set of item response weights assigned by the investigator to initiate an iterative process which converges to a weighting scheme which maximizes the internal consistency of the instrument. The set of item response weights yielded by the final iteration is used to obtain a weighted total score for each person, object, etc. The method assumes that a single variable underlies all items in the instrument and that the investigator knows to some degree which item responses are related to the underlying variable. The *a priori* weighting scheme initiates the iterative procedure hence, it is important that care be taken in establishing the weights in order to minimize the number of iterations required. According to Mosier (1946) the weighting scheme produced has the following properties:

(a) The reliability of each item and the internal consistency of the weighted inventory are maximized.

(b) The correlation between item and total score is maximized.

(c) The coefficient of variation is maximized.

(d) The correlation between item and total score is proportional to the standard deviation of the item weights for that item.

(e) Questions which bear no relation to the total score variable are automatically weighted so that they exert no effect on the scoring.

The pattern of weights obtained is very informative. An item which has no relation to the objectives of the questionnaire will receive equal weights for all of its responses. Items whose responses differentiate between high and low scoring persons will receive weights which have a large range of values. This range is proportional to the degree of discrimination of the item responses.

* From Baker (1969), pp. 8-9, 64-5.

In order to initiate the iterative reciprocal averages procedure, the investigator must provide an a priori set of item response weights for each item of interest. The a priori weights are used to score the response choices of the subjects, compute the Hoyt internal consistency reliability coefficients, and derive a new set of weights. The iterative procedure continues until the difference between two successive Hoyt internal consistency reliability indices is less than .02. When this occurs, the corresponding total scores are printed as are the derived set of weights.

Interpretation of Results

If the items within the instrument do in fact measure a single underlying variable and the items are scalable, the reliability coefficient printed after each iteration should increase in value.

The print-out of the final set of weights and the accompanying response choice frequencies contain information which serves as the basis for interpreting the results. In the ideal case the weights assigned to the response choices of an item are monotonic. For example, a perfect 5 choice item would be weighted 1 2 3 4 5 or 5 4 3 2 1. The response choice frequencies would be symmetrical. For example: If a sample of 100 responded to a five choice item, the number responding would be approximately 10, 25, 30, 25, 10. Extremely poor items yield equal weights for all response choices or have all the responses piling up at a particular end of the scale. For example the following are poor items:

	Item Choice					Number Responding				
Item	1	2	3	4	5	1	2	3	4	5
1	4	4	4	4	4	10	25	30	25	10
2	3	2	1	1	6	40	50	2	7	1

The first is poor because it cannot discriminate between persons choosing the various responses. The second is a poor item because nearly all the subjects chose either responses 1 or 2 and the remaining three weights are based on a small proportion of the sample.

Appendix E

Word-Pair Characteristics for Pilot Version of Semantic Differential

Appendix E-1

Word-Pair Characteristics for Pilot Version of Semantic Differential

"Our World of Today"

N = 202 students

Optimistic (Positive) Pole		Response Position One	Two	Three	Four	Five	Pessimistic (Negative) Pole	Decision
Good	N	34	52	79	25	12	Bad	RETAIN
	RAVE wt.	6	5	4	2	1		
	r biser.	.57	.36	-.10	-.64	-.75		
Like	N	59	64	55	16	8	Dislike	OMIT skewed distribution
	RAVE wt.	6	4	3	2	1		
	r biser.	.66	.07	-.32	-.54	-.77		
Neat	N	13	16	33	63	77	Littered	RETAIN
	RAVE wt.	7	6	5	4	3		
	r biser.	.60	.50	.41	-.08	-.49		
Roomy	N	11	21	72	50	48	Crowded	OMIT poor discrimination
	RAVE wt.	6	7	4	4	3		
	r biser.	.47	.58	.17	-.22	-.48		
Valuable	N	78	62	46	11	5	Worthless, Cheap	OMIT skewed distribution poor discrimination
	RAVE wt.	5	4	3	2	2		
	r biser.	.43	.03	-.29	-.59	-.38		

Appendix E-1 (cont.)

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Decision
Bright	N	35	71	63	22	11	Gloomy	OMIT poor discrimination children questions
	RAVE wt.	6	5	3	2	3		
	r biser.	.54	.36	-.32	-.65	-.35		
Healthful	N	26	60	73	31	12	Sickening	RETAIN
	RAVE wt.	7	5	4	2	1		
	r biser.	.64	.39	-.15	-.50	-.81		
Pretty	N	49	49	68	24	12	Ugly	RETAIN
	RAVE wt.	6	5	4	2	1		
	r biser.	.66	.29	-.17	-.72	-.75		
Perfect	N	8	33	82	39	40	Imperfect	OMIT skewed distribution
	RAVE wt.	7	6	4	3	2		
	r biser.	.39	.64	.12	-.29	-.57		
Beautiful	N	32	93	52	20	5	Ugly	OMIT skewed distribution. poor discrimination - also "ugly" used twice in pilot
	RAVE wt.	7	5	3	1	1		
	r biser.	.63	.33	-.30	-.82	-.74		
Happy	N	45	66	70	15	6	Sad	OMIT skewed distribution - poor discrimination. children questions
	RAVE wt.	6	5	4	1	1		
	r biser.	.60	.24	-.31	-.68	-.84		

Appendix E-1 (cont.)

Optimistic* Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Decision
Pure	N	6	10	48	69	69	Polluted	OMIT skewed distribution low discrimination
	RAVE wt.	7	7	6	4	3		
	r biser.	.59	.49	.46	-.03	-.60		
Safe	N	13	25	76	53	35	Dangerous	RETAIN
	RAVE wt.	7	6	5	3	2		
	r biser.	.62	.44	.20	-.30	-.56		
Sweet-smelling	N	12	50	90	29	21	Polluted	RETAIN
	RAVE wt.	7	6	4	2	1		
	r biser.	.63	.52	.07	-.51	-.83		
Sunny	N	38	67	60	23	14	Hazy	RETAIN
	RAVE wt.	6	5	4	2	1		
	r biser.	.60	.32	-.34	-.59	-.82		
Clean	N	10	31	74	61	26	Dirty	RETAIN
	RAVE wt.	7	6	5	3	2		
	r biser.	.77	.48	.31	-.46	-.71		
Pleasant	N	35	64	72	21	10	Unpleasant	RETAIN
	RAVE wt.	7	5	3	2	1		
	r biser.	.78	.30	-.35	-.59	-.66		

Appendix E-1 (cont.)

Optimistic Positive Pole		Response Position					Pessimistic Negative Pole	Decision
		One	Two	Three	Four	Five		
Nice	N	37	83	59	13	10	Awful	RETAIN
	RAVE wt.	7	5	3	2	1		
	r biser	.74	.24	-.42	-.53	-.76		

Appendix E-2

Word-Pair Characteristics for Pilot Version of Semantic Differential

"Our World of Tomorrow"

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Decision
Neat	N	36	55	32	30	49	Littered	RETAIN
	RAVE wt.	7	6	4	3	2		
	r biser.	.79	.46	.11	-.33	-.99		
Safe	N	41	52	36	29	44	Dangerous	RETAIN
	RAVE wt.	7	6	4	3	1		
	r biser.	.78	.42	.13	-.40	-1.0		
Pretty	N	48	50	42	27	35	Ugly	RETAIN
	RAVE wt.	7	6	4	2	1		
	r biser.	.80	.40	.01	-.56	-1.0		
Like	N	67	53	34	16	32	Dislike	OMIT (See "World Today")
	RAVE wt.	6	5	3	2	1		
	r biser.	.89	.17	-.28	-.46	-1.0		
Happy	N	64	51	36	23	38	Sad	OMIT (See "World Today")
	RAVE wt.	6	5	4	2	1		
	r biser.	.78	.27	-.12	-.61	-.97		

Appendix E-2 (cont.)

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Decision
Perfect	N	31	46	50	38	37	Imperfect	OMIT (See "World Today")
	RAVE wt.	7	6	4	3	2		
	r biser.	.66	.55	.09	-.50	-.81		
Sunny	N	56	46	39	32	29	Hazy	RETAIN
	RAVE wt.	7	5	4	3	1		
	r biser.	.85	.24	-.12	-.49	-.89		
Clean	N	46	60	22	25	46	Dirty	RETAIN
	RAVE wt.	7	6	4	3	1		
	r biser.	.82	.43	-.04	-.40	-.99		
Pure	N	31	48	39	27	57	Polluted	OMIT (See "World Today")
	RAVE wt.	7	6	5	3	2		
	r biser.	.75	.49	.20	-.25	-.98		
Pleasant	N	48	62	30	24	38	Unpleasant	RETAIN
	RAVE wt.	7	5	3	2	1		
	r biser.	.86	.35	-.18	-.44	-.97		
Good	N	53	56	41	22	30	Bad	RETAIN
	RAVE wt.	7	5	4	2	1		
	r biser.	.85	.32	-.15	-.57	-1.0		

Appendix E-2 (cont.)

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Decision
Valuable	N	58	46	48	26	24	Worthless, Cheap	OMIT low discrimination also see "World Today"
	RAVE wt.	6	5	4	2	2		
	r biser.	.69	.25	-.07	-.67	-.76		
Nice	N	47	59	44	32	20	Awful	RETAIN
	RAVE wt.	7	5	4	2	1		
	r biser.	.84	.36	-.12	-.77	-.92		
Bright	N	55	49	44	29	25	Gloomy	OMIT (See "World Today")
	RAVE wt.	6	5	4	3	1		
	r biser.	.78	.34	-.17	-.52	-.96		
Beautiful	N	55	59	43	20	25	Ugly	OMIT (See "World Today")
	RAVE wt.	6	5	3	2	1		
	r biser.	.79	.33	-.20	-.68	-.97		
Healthful	N	57	58	26	30	21	Sickening	RETAIN
	RAVE wt.	6	5	3	2	1		
	r biser.	.84	.27	-.15	-.56	-.91		
Sweet-smelling	N	42	50	48	29	33	Stinking	RETAIN
	RAVE wt.	7	5	4	3	1		
	r biser.	.83	.39	.00	-.51	-1.00		

Appendix E-2 (cont.)

Optimistic Positive Pole		Response Position					Pessimistic Negative Pole	Decision
		One	Two	Three	Four	Five		
Roomy	N	31	29	47	42	53	Crowded	OMIT (See "World Today")
	RAVE wt.	7	6	5	4	2		
	r biser.	.74	.32	.19	-.12	-.83		

Appendix F

Decisions About Use of Likert Statements Included in Pilot Version of "Some Ideas I Have"

Appendix F

Decisions About Use of Likert Statements Included in

Pilot Version of "Some Ideas I Have"

LIKERT STATEMENT	DECISION**
1. From now on, people getting married should have no more than two children.	R
2. We have enough parks and forests now for wild animals to live in.	R
3. Motor bikes and motorcycles should be made quieter.	RM
4. It is O.K. for the number of people in our country to get bigger.	RM
5. On a picnic, take paper plates and cups instead of plates and cups you used over.	O
6. I litter a lot.	O
7. Walking in the woods is spoiled if too many people are there.	RM
8. Soon there may be too many people living on the earth.	RM
9. If my dad owned a marsh where ducks lived, I would like a playground built there.	RM
10. There is too much on TV about pollution and the environment.	RM
11. Too much noise is not really a problem to worry about.	RM
12. I would be willing to keep people out of a park near by home, if wild animals needed a safe home there.	O
13. We need more laws to help stop pollution.	O
14. The best way to get rid of old newspapers is to burn them.	RM
15. There is not much one person can do to help the environment.	RM
16. I think I can help solve some pollution problems.	RM
17. It is important to learn about environmental problems in school.	O
18. My neighborhood should be kept clean, even if I would have to pick up litter after school one day a week.	RM
19. If my car made too much air pollution, I would get it fixed.	RM
20. My family cannot do any more to help stop pollution.	O

*Complete statistical performances for items are included in Table

**R - Retain; RM - Retain with Modifications; O - Omit.

LIKERT STATEMENT	DECISION
21. Don't waste the best TV time with programs about pollution.	R
22. I think paper should be recycled (used over) even if I have to help collect it.	O
23. Children worry too much about problems of the environment.	RM
24. Paper towels are better than cloth towels in a school washroom.	O
25. Parents should have as many children as they want.	R
26. I like to hear a lot about environmental problems.	O
27. If a city needs more homes for people, then build taller buildings. Don't use up land outside the city.	O
28. Milk at school should come in bottles that can be used over, not paper cartons.	R
29. Overpopulation (too many people) is the cause of many problems today.	RM
30. I feel responsible for causing some pollution.	RM
31. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.	R
32. Sometimes people protesting about pollution can help as much as a law against pollution.	O
33. We should do more to protect forests and wild animals.	O
34. I do not worry very much about the environment.	RM
35. Soda pop should be sold only in bottles that can be used again, not in cans.	R
36. I cannot find and solve environmental problems around where I live.	R
37. Pollution is the number one problem in our country.	O

Appendix G

Item Characteristics for Pilot Version of Likert Based Instrument "Some Ideas I Have"

Appendix G

Item Characteristics for Pilot Version of Likert Based Instrument

"Some Ideas I Have"

N = 202 Students

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
1. From now on people getting married should have no more than two children.	N	13	20	53	61	55	3.62 — 2.8	1.37	RETAIN
	RAVE wts.	7	7	5	2	4			
	r biser.	.45	.51	.05	-.30	-.20			
2. We have enough parks and forests now for wild animals to live in.	N	13	17	32	57	83	3.89 — 2.8	1.48	RETAIN
	RAVE wts.	5	1	2	4	6			
	r biser.	-.35	-.35	-.35	-.04	.51			
3. Motorbikes and motorcycles should be made quieter.	N	62	66	48	16	10	2.24 — 3.2	1.26	Change* "quieter" to "more quiet".
	RAVE wts.	6	4	4	2	5			
	r biser.	.30	.09	-.17	-.27	-.42			
4. It is O.K. for the number of people living in our country to get bigger.	N	14	37	71	46	34	3.24 — 3.4	1.31	Change* "get bigger" to "increase. (This means more people would live here.)"
	RAVE wts.	5	1	4	5	7			
	r biser.	-.20	-.51	-.14	.34	.43			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
5. On a picnic, take paper plates and cups instead of plates and cups you use over.	N	45	54	48	28	27	2.69 — 2.7	1.75	OMIT low panel rating low discrimination weak negative correlations
	RAVE wts.	5	3	4	5	6			
	r biser.	-.16	-.23	-.01	.26	.32			
6. I litter a lot.	N	4	13	50	55	80	3.96 — Not rated	1.08	OMIT Low N, response 1 low discrimination weak correlations
	RAVE wts.	5	3	3	5	5			
	r biser.	-.04	-.21	-.29	.10	.22			
7. Walking in the woods is spoiled if too many people are there.	N	58	56	40	31	17	2.47 — 3.0	1.64	Modify to improve discrimination. Change "spoiled" to "not as much fun".
	RAVE wts.	6	3	3	3	7			
	r biser.	.48	-.11	-.20	-.26	-.12			
8. Soon there may be too many people living on the earth.	N	57	59	48	24	14	2.40 — 3.6	1.47	RETAIN
	RAVE wts.	7	4	2	1	5			
	r biser.	.69	.04	-.38	-.42	-.34			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
9. If my Dad owned a marsh where ducks lived, I would like a playground built there.	N	20	14	23	47	98	3.94 — 2.8	1.77	Change* to "If my Dad owned a marsh or woods where some animals lived, I would like part of it made into a playground (like at school).
	RAVE wts.	5	2	1	2	6			
	r biser.	-.24	.38	-.31	-.14	.49			
10. There is too much on TV about pollution and the environment.	N	8	26	48	58	62	3.69 —	1.34	Modify to improve response distribution. Change* "pollution and the environment" to "problems with pollution".
	RAVE wts.	6	2	2	4	7			
	r biser.	-.18	-.30	-.36	-.08	.61			
11. Too much noise is not really a problem to worry about.	N	16	19	23	84	60	3.75 — 3.6	1.45	OMIT low discrimination
	RAVE wts.	6	3	2	3	6			
	r biser.	-.20	-.25	-.30	-.10	.49			
12. I would be willing to keep people out of a park near my home, if wild animals needed a safe home there.	N	88	68	33	8	5	1.88 — 2.9	.97	Need better statistics. Change to "If wild animals need a safe home, it would be best to put them in a nice zoo".
	RAVE wts.	6	2	3	2	7			
	r biser.	.45	-.32	-.20	-.22	.07			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
13. We need more laws to help stop pollution.	N	128	46	22	2	2	1.35 — 2.3	.77	OMIT bad statistics low panel rating
	RAVE wts.	6	1	1	1	7			
	r biser.	.59	-.39	-.49	-.70	.12			
14. The best way to get rid of old newspapers is to burn them.	N	4	17	26	50	105	4.16 — 3.0	1.14	Need better statistics. Change to "I would get rid of old newspapers by burning them. This is an easy way".
	RAVE wts.	6	1	3	2	6			
	r biser.	.06	-.51	-.22	-.25	.51			
15. There is not much one person can do to help the environment.	N	14	28	36	57	67	3.68 — 3.4	1.55	RETAIN (Underline "not" and add "and stop pollution.")
	RAVE wts.	5	1	2	4	7			
	r biser.	-.20	-.33	-.30	-.03	.37			
16. I think I can help solve some pollution problems.	N	49	81	66	4	2	2.15 — 3.4	.72	Need better statistics. Change to "I think there are a lot of pollution problems I can help stop".
	RAVE wts.	7	4	3	1	7			
	r biser.	.40	-.07	-.21	-.47	.09			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
17. It is important to learn about environmental problems in school.	N	61	94	41	6	0	1.96	.63	OMIT bad statistics low panel rating
	RAVE wts.	7	3	1	5	0	—		
	r biser.	.49	-.16	-.38	.02	.00	2.2		
18. My neighborhood should be kept clean, even if I would have to pick up litter after school one day a week.	N	78	92	21	9	2	1.84	.73	Need better statistics. Change to "I want my neighborhood kept clean. Everyone should pick up his own litter. I should not have to pick up someone else's mess".
	RAVE wts.	6	4	1	1	5	—		
	r biser.	.27	.02	-.37	-.34	-.49	3.0		
19. If my car made too much pollution, I would get it fixed.	N	104	79	15	3	1	1.60	.54	"If a person's car makes too much air pollution, he should not be allowed to drive it." *
	RAVE wts.	6	2	2	1	1	—		
	r biser.	.42	-.26	-.32	-.41	-.45	3.2		
20. My family cannot do any more to help stop pollution.	N	7	9	34	74	78	4.02	1.05	OMIT bad statistics low panel rating
	RAVE wts.	7	2	1	2	7	—		
	r biser.	-.00	-.32	-.42	-.22	.57	2.6		

Appendix G (cont.)

Item		Response Position SA	A	NS	D	SD	Item Mean Panel Rating	Variance	Decision
21. Don't waste the best T.V. time with programs about pollution.	N	12	27	60	56	47	3.49 — 3.0	1.35	RETAIN
	RAVE wts.	5	1	3	4	7			
	r biser.	-.33	-.37	-.20	.0[illegible]	.59			
22. I think paper should be recycled (used over) even if I have to help collect it.	N	106	60	27	7	2	1.70 — Not rated	.80	OMIT poor distribution skewed mean
	RAVE wts.	6	2	2	1	3			
	r biser.	.53	-.25	-.35	-.45	-.50			
23. Children worry too much about problems of the environment.	N	9	20	62	59	52	3.62 — 2.8	1.22	Need better statistics. Add "(like pollution problems)".
	RAVE wts.	7	2	3	4	7			
	r biser.	.06	-.35	-.25	.03	.41			
24. Paper towels are better than cloth towels in a school washroom.	N	43	50	48	34	27	2.76 — 2.2	1.75	OMIT low panel rating
	RAVE wts.	5	2	4	4	7			
	r biser.	-.11	-.27	-.04	.12	.46			
25. Parents should have as many children as they want.	N	65	53	33	25	26	2.47 — 3.4	1.89	RETAIN
	RAVE wts.	5	2	4	6	7			
	r biser.	-.30	-.26	.01	.40	.53			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
26. I like to hear a lot about environmental problems.	N	19	40	53	43	47	2.92 — 2.8	1.08	OMIT low discrimination weak correlations
	RAVE wts.	7	5	4	4	5			
	r biser.	.39	.06	-.11	-.07	-.01			
27. If a city needs more homes for people, then build taller buildings. Don't use up land outside the city.	N	46	54	71	23	8	3.53 — 1.6	1.18	OMIT low panel rating bad statistics
	RAVE wts.	7	4	3	3	5			
	r biser.	.47	.03	-.28	-.25	-.02			
28. Milk at school should come in bottles that can be used over, not paper cartons.	N	46	60	40	42	14	2.14 — 3.2	1.54	RETAIN
	RAVE wts.	7	4	2	4	5			
	r biser.	.45	.08	-.27	-.17	-.30			
29. Overpopulation (too many people) is the cause of many problems today.	N	59	80	43	16	4	2.26 — 3.4	.99	Poor distribution and discrimination Change to "the cause of many problems in the world today is too many people".
	RAVE wts.	7	3	3	1	3			
	r biser.	.58	-.12	-.28	-.38	-.29			
30. I feel responsible for causing some pollution.	N	32	106	49	10	5	2.26 — 3.4	.76	Skewed distribution. Change to "People (like me) are the cause of most pollution problems.
	RAVE wts.	7	5	3	1	6			
	r biser.	.28	.13	-.22	-.42	-.14			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
31. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.	N	19	21	46	63	53	3.54 — 2.8	1.56	RETAIN
	RAVE wts.	6	1	1	4	7			
	r biser.	-.22	-.48	-.37	.01	.71			
32. Sometimes people protesting about pollution can help as much as a law against pollution.	N	41	75	63	17	6	2.37 — 2.6	.99	OMIT low panel rating
	RAVE wts.	6	3	4	4	7			
	r bis.	.25	-12	-.15	.04	.31			
33. We should do more to protect forests and wild animals.	N	137	44	11	5	5	1.50 — Not rated	.81	OMIT skewed distribution
	RAVE wts.	6	1	2	2	6			
	r biser.	.53	-.44	-.32	-.34	-.06			
34. I do not worry very much about the environment.	N	9	23	59	58	53	3.61 — 3.4	1.26	Improve distribution. Change* to "I worry about the environment (problems like pollution)".
	RAVE wts.	6	1	2	5	7			
	r biser.	-.12	-.46	-.38	.12	.58			
35. Soda pop should be sold only in bottles that can be used again, not in cans.	N	57	65	37	30	13	2.39 — 3.4	1.49	RETAIN
	RAVE wts.	6	4	3	3	6			
	r biser.	.49	.00	-.23	-.32	-.27			

Appendix G (cont.)

Item		Response Position 1 SA	2 A	3 NS	4 D	5 SD	Item Mean Panel Rating	Variance	Decision
36. I cannot find and help solve environmental problems around where I live.	N	12	15	53	70	52	3.71 — 3.9	1.11	RETAIN
	RAVE wts.	5	4	1	5	7			
	r biser.	.47	.14	-.45	-.21	-.27			
37. Pollution is the number one problem in our country.	N	75	45	50	24	8	2.23 — 2.5	1.40	OMIT low panel rating
	RAVE wts.	6	4	4	3	1			
	r biser.	.29	-.03	-.13	-.14	-.37			

*Necessary revision to improve item interpretability for children.

Appendix H

Pilot Version of EDI Stories

Student Response Categories

and Distribution

Appendix H-1 Student Response Categories

and Distribution

Story One, "Wilderness Use"**

The Jackson family was talking over plans for a summer vacation. "Could we go out West, Dad?" Tom asked. "There are some neat National Parks with lots of wilderness. You can see many mountains and lakes when you hike and camp."

"Those lakes might have some good fishing," said Tom's dad. "We could take the camping trailer and motorboat."

"Except there are no roads or big campgrounds, Dad," explained Tom. "And they don't let motorboats on the lakes. You have to use canoes. If you really want to see the Park, you have to hike and camp. And sleep in tents."

Tom's mother and sister do not like to hike and camp. They like to see the scenery from a car. But Tom and his dad enjoy hiking and camping.

People don't agree about how National Parks should be used. Some people say wilderness areas should be left alone. (Motorboats and camping trailers don't belong there. If too many people come with thier motorboats and camping trailers, the wilderness might be ruined for everyone.) These people say that only hiking trails, not highways should be built in the wilderness areas.

Other people say wilderness areas belong to all the people. (They should be used by more people.)* So more campgrounds and roads should be built. (Motorboats should be allowed on lakes.)* This way many more people will come and enjoy the areas.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*Indicates material not included in short version of the story.
**Titled "Wilderness" in final EDI.

Response Categories:

1. Personal Orientation

A response of this nature uses the family disagreement as its focus, and fails to see the larger issue posed in the story.

2. Use Advocate

Natural areas are for man's enjoyment and should be developed so enjoyment is maximized. In context of the story, responses can include "more campgrounds", "more roads", or "motorboats are OK."

3. Mixture of Use and Preservation

Represents some type of compromise between use of natural areas and preserving their character.

4. Wilderness Preservation

Man should only be a "visitor" to these areas. In the context of the story, negative comments regarding roads, campgrounds and motorboats are given.

5. Blanks/No Solution

Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

Frequency of Proposed Solutions To
Short and Long Story Versions
"Wilderness Use"

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Personal Orientation	N	16	9.5	22.5
	%	20	12.0	16
Use Advocate	N	17	13.5	30.5
	%	21.3	17.1	19.2
Mixture of Use and Preservation	N	16	26	42
	%	20	32.9	26.4
Wilderness Preservation	N	26.5	28	54.5
	%	33.1	35.4	34.3
Blanks/No Solution	N	4.5	2	6.5
	%	5.6	2.5	4.1
TOTALS	N	80	79	159
	%	50.3	49.7	100.00

Chi Square (4 df)= 3.45 (n.s.)
Observer agreement= .97

Appendix H-2 Student Response Categories

and Distribution

Story Two, "Clear Cutting"

Jim's family was visitng a big National Forest on their vacation.

"Hey, dad, what are all those holes in the forest?" Jim asked.

"Those aren't holes, Jim," answered his father. "Those are areas where lumber companies have cut down all the trees. They call it clear-cutting."

"Why do they cut down all the trees?" Jim wondered.

Jim's father explained that (lumber companies rent some of the land from the government.)* The companies say that cutting down all the trees in one place saves money. It is faster and less work. (If only some trees were cut, it would take more time to get them out of the forest. The lumber companies also say)* some kinds of trees that make good lumber grow better when clear-cutting is used.

(Jim thought, "I guess we do need lumber. The more people there are, the more lumber we need to build houses and things.")*

Other people say that clear-cutting ruins the homes of many animals like squirrels and chipmunks. When all the trees are cut down, soil can be washed away easier. These people say the clear-cut places in the forest look ugly.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*Indicates material not included in short version of the story.

Response Categories

1. Clear-Cutting is O.K.

   Primary approval of technique due to need of lumber. Some reference to watching out for animals may appear.

2. Compromise

   Recognizes the need for lumber and protection of the natural environment. Use the technique,but plant more trees is often stated.

3. Stop Clear-Cutting

   The practice should be stopped. Lumber should be obtained by different techniques.

4. Various Other Solutions

5. Blanks/No Solution

   Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

Frequency of Proposed Solutions To
Short and Long Story Versions
"Clear-Cutting"

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Clear-Cutting Is O.K.	N	6	16.5	22.5
	%	5.9	17.2	11.4
Compromise	N	31.5	30	61.5
	%	31.2	31.2	31.2
Stop Clear-Cutting	N	49	37.5	86.5
	%	48.5	39	44
Various Other Solutions	N	9.5	3	12.5
	%	9.4	3.1	6.3
Blanks/ No Solution	N	5	9	14
	%	4.9	9.4	7.1
TOTALS	N	101	79	159
	%	63.1	36.9	100.00

Chi Square (4 df)= 10.87
$p < .05$
Observer Agreement= .96

Appendix H-3 Student Response Categories

and Distribution

Story Three, "Strip Mining"

Sandy and her family live in southeastern Ohio. One Saturday she went with her dad to watch some strip mining.

"Strip mining is when big shovels scrape off the top part of the ground. This lets them get at the coal underneath," Sandy's dad explained.

("Don't they dig tunnels like in regular mines?" asked Sandy.

"No. As long as the coal is not too deep underground, it is cheaper to get it out this way," answered her dad.)*

Sandy remembered reading about strip mining. The book said it is cheaper and faster than digging a tunnel mine. It also gets more of the coal out of the ground than a tunnel mine.

(Strip mines are safer for the people working there too. Tunnel mines can have fires deep in the earth. Strip mines can not.

Burning the coal from strip mines makes a lot of electricity.)*

But to get the coal out, the land is turned upside down. Little can grow on the rocky hills after a place is strip mined. Animals lose their homes. Soil washes away into nearby streams.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*Indicates material not included in short version of the story.

Response Categories

1. Strip Mining is O.K.

   The need for coal, and the advantages of strip mines (safety) are indicated. Responses often include a footnote to "fill up the land afterwards."

2. Stop Strip Mining

   The practice should be terminated.

3. Use Tunnel Mines

   Focus is on tunnel mines rather than strip mines.

4. "Citizen Action" Solution

   Response may indicate a compromise, but also include a law, hearing or other public route to achieve results.

5. Concern for Animals

   In listing his solution, student shows a great concern for animals' homes and strip mines.

6. Various Other Solutions

7. Blanks/No Solution

Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

Frequency of Proposed Solutions To
Short and Long Story Versions
"Strip Mining"

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Strip Mining is O.K.	N	19.5	33.5	53
	%	20.5	36.4	28.3
Stop Strip Mining	N	14.5	16.5	31
	%	15.3	17.9	16.6
Use Tunnel Mines	N	25.5	10.5	36
	%	26.8	11.4	19.3
"Citizen Action" Solution	N	1	2.5	3.5
	%	1.1	2.7	1.9
Concern for Animals	N	24	16	40
	%	25.3	17.4	21.4
Various Other responses	N	5	4.5	9.5
	%	5.3	4.9	5.1
Blanks/No Solution	N	5.5	8.5	14
	%	5.8	9.2	7.5
TOTALS	N	95	92	187
	%	50.8	49.2	100.0

Chi Square (5 df)= 12.35
$p<.05$
Observer Agreement= .98

Appendix H-4 Student Response Categories

and Distribution

Story Four, "Air Pollution (rural)"**

Donna, Carol (and Cindy)* live in a small town called Smithville. On their way home from school, they pass the only factory in town. Donna's father works at the factory.

"Boy, look at all the smoke coming out of that chimney," said Carol. "It sure makes the air smelly. Maybe the owner should be forced to stop all that dirt from going into the air."

(Cindy said. "The air is free and belongs to everyone. I don't know if anyone can be stopped from using it as he likes.")*

"My dad said the owner would close the factory if he had to stop all that smoke," Donna said. "He can't afford to stop the smoke."

(Many people in Smithville work at the factory. They need their jobs at the factory. There are not many other jobs in town.)*

(Besides, the factory makes many useful things. And many people in Smithville and other places enjoy these things.)*

But the air pollution coming from the factory is smelly and dirty. A lot of it could make you sick. Many visitors to Smithville think the air is not clean.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*Indicates material not included in short version of the story
** Titled "Smithville" in final EDI.

Response Categories

1. Stop Air Pollution

   Factory should be forced to stop the air pollution, regardless of the consequences. If necessary, shut it down.

2. Avoid the Problem

   Solutions include moving away, or getting another job. The environmental problem is not dealt with.

3. Compromise/Citizen Action

   Some type of community support for the industry is included here. Also included is voting on what's to be done.

4. Technological Solutions

   Statements involve installing devices the child thinks will solve the problem.

5. Blanks/No Solution

Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

6. Don't Know/Can't do Anything

Frequency of Proposed Solutions To
Short and Long Story Versions
"Air Pollution"
(rural)

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Stop Air Pollution	N	38.5	29.5	68
	%	32.1	25	28.6
Avoid the Problem	N	5.5	6	11.5
	%	4.6	5.1	4.8
Compromise/"Citizen Action"	N	26.5	29.5	56
	%	22.1	25	23.5
Technological Solution	N	33	36.5	69.5
	%	27.5	31	29.2
Blanks/ No Solution	N	12.5	10.5	23
	%	10.4	9.8	9.7
Don't Know/Can't Do Anything	N	4	6	10
	%	3.3	5.1	4.2
TOTALS	N	120	118	238
	%	50.4	49.6	100.00

Chi Square(5 df)=2.75 (n.s.)

Observer Agreement= .98

Appendix H-5 Student Response Categories

and Distribution

Story Five, "Air Pollution (urban)"**

Jo Lynn, her mother and baby brother Timmy lived near a big automobile plant in a large city. The family has no father. So Jo Lynn's mother works at the plant. Each day many cars are made there.

(Sometimes the air in the city gets very hazy. Timmy has trouble breathing when the air gets so hazy. He breathes better when the air is clean.)*

There is a lot of dirt in the area where Jo Lynn lives. (For example, it is hard to keep windows clean. They get dirty very fast.)*

Some people blame the auto plant for this. They say the dirt in the air comes from there. They say the plant owners should stop putting dirt into the air.

The plant owners say stopping air pollution would cost too much. They would have to get more money for their cars to pay for cleaning the air. What if people would not pay the higher prices? The new cars would not be sold. Then the auto plant would have to close.

Jo Lynn's mother needs a job. She has to work to get money for Jo Lynn and Timmy.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*indicates material not included in short version of the story
** titled "The Auto Factory" in final EDI

Response Categories

1. Avoid the Problem

These responses focus on a personal orientation to the dilemma which ignores the environmental problem. Solutions proposed include "moving away," "moving the factory away," etc.

2. Technical Solution

Some mechanical device which the child thinks will solve the problem.

3. Shut down the factory

"Stop polluting, clean air is more important than jobs" is the general message here.

4. Compromise

Some approach which may include community support for the problem, or raising money for pollution control devices.

5. Various Other Solutions

6. Blanks/No Solution

Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

Frequency of Proposed Solutions To
Short and Long Story Versions
"Air Pollution"
(urban)

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Avoid the Problem	N	45	50.5	95.5
	%	36	41.1	38.5
Technological Solution	N	31	30	61
	%	24.8	24.4	24.6
Shut Down the Factory	N	21.5	20	41.5
	%	17.2	16.3	16.7
Compromise	N	14.5	13.5	28
	%	11.6	11	11.3
Various Other Solutions	N	4	3	7
	%	3.2	2.4	2.8
Blanks/No Solution	N	9	6	15
	%	7.2	4.9	6
TOTALS	N	125	123	248
	%	50.4	49.6	100.00

Chi Square (5 df)= 1.13 (n.s.)
Observer agreement=.98

Appendix H-6 Student Response Categories

and Distribution

Story Six, "Water Pollution"**

One day, Tony and his friend Steve were walking along the river near a paper mill.

"Gosh, look at the funny color going into the river from that paper mill," said Tony.

"It sure is changing the water, " Steve agreed.

Fish and other water animals cannot live in the river near the paper mill. Some people say the paper mill should stop dumping these things into the water.

The owners say the mill is old. When it makes paper, it also makes water pollution. It would cost too much money to change the mill now.

Tony's father works at the mill. He says, "If they are told to stop polluting the river, the mill owners will close the paper mill instead."

(Many other people work at the paper mill. They spend the money they get from their jobs in the town. So the town needs the paper mill too.)*

(But some other nearby towns get their water from the river. They don't like the pollution in the river from the paper mill.)*

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*indicated material not included in shorter version of the story.
** titled "The Paper Mill" in final EDI.

Response Categories

1. Stop Water Pollution

   Close the factory if necessary, but the pollution must stop.

2. Avoid the Problem

   Some method of avoiding the problem rather than "solving" it. Examples include moving the mill, getting different jobs or dumping the pollution somewhere other than the river.

3. Compromise

   The town lends money or support for helping alleviate the problem.

4. Technological

   Install equipment to solve the problem. Included in this category is "get a new mill."

5. Blank/No Solution

Category included blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

6. Paper Mill is O.K.

Nothing need be done about the problem. We need paper.

Frequency of Proposed Solutions To
Short and Long Story Versions
"Water Pollution"

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Stop Water Pollution	N	73	62	135
	%	49	43.4	46.2
Avoid the Problem	N	33	30.5	63.5
	%	22.1	21.3	21.7
Compromise	N	7	18.5	25.5
	%	4.7	12.9	8.7
Technological Solution	N	27.5	17	44.5
	%	18.5	11.9	15.2
Blanks/No Solution	N	7.5	12	19.5
	%	5.0	8.4	6.7
Paper Mill is O.K.	N	1	3	4
	%	.7	2.1	1.4
TOTALS	N	149	143	292
	%	51.0	49.0	100.00

Chi Square (4 df)=10.34
$p < .05$
Observer Agreement=.99

Appendix H-7 Student Response Categories

and Distribution

Story Seven, "Solid Waste/Recycling"**

Linda and her family live in Cedar City. On the way to school one day, Linda saw a lot of cans, bottles and other things lying around. She saw them in vacant lots, in the river and around the park.

That day her teacher talked about this problem. "Cedar City has grown over the last few years," said the teacher. "This means more waste to get rid of."

(She said the city dump, where all the garbage goes, is filling up fast.)*

Some people say the local company that makes soda pop, the Super Cola Company, is partly to blame. They are selling soda in cans and throw-away bottles. These containers quickly become garbage. Some people say it would be better for Super Cola to sell soda in returnable bottles. Thses bottles could be used over and over again, not just once.

Super Cola says that supermarkets in Cedar City do not like returnable bottles. They take up too much space. It is easier and cheaper for supermarkets to sell soda pop in cans and throw-away bottles.

(Super Cola also says that cans and bottles are only a small part of the garbage in Cedar City. And even if returnable bottles were used, people might still throw them away. Super Cola says most people think it is easier to use throw-away bottles and cans.)*

The Cedar City Nature Club wants the City Council to pass a law to stop the selling of cans and throw-away bottles in Cedar City.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

* indicates material not included in shorter version of story
** titled "Cedar City" in final EDI.

Response Categories

1. Recycling

   General idea involving use of materials again.

2. "Citizen Action"

   Laws, hearings, enforcement of anit-littering ordinances.

3. "Don't throw trash around"

   Responses which simplify the issue of solid waste/recycling to one of merely putting trash in the proper containers.

4. Blank/No Solution

Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

5. Various Other Solutions

Frequency of Proposed Solutions To
Short and Long Story Versions

"Solid Waste"

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Recycling	N	47.5	42.5	90
	%	46.6	46.7	46.6
Citizen Action	N	13	13.5	26.5
	%	12.7	14.8	13.0
"Don't Throw Trash Around"	N	32	21	53
	%	31.4	23.1	27.5
Blank/No Solution	N	4.5	9	13.5
	%	4.4	9.9	7
Various Other Solutions	N	5	5	10
	%	4.9	5.5	5.2
TOTALS	N	102	91	193
	%	52.9	47.1	100.00

Chi Square (4 df)=3.45 (n.s.)

Observer Agreement=.98

Appendix H-8 Student Response Categories

and Distribution

Story Right, "Land Use"**

Newtown is a city of 4 million people. It is a big city. It has factories, parks, homes and roads.

The people in Newtown drive their cars everywhere. The roads are jammed with cars every day. The City Council has just bought a strip of land shown in this map along the dashed (---) line. They are trying to decide how to use this land.

There are two expressways near Newtown, route 1 and route 2. Some people say another expressway should be built. This would help speed up traffic.

Other people say more cars make more air pollution. They think that people should use buses and trains to go around Newtown. This would lower air pollution, traffic and noise. So they say the land should be used for train or bus routes.

If the new expressway is built, many people living near the dashed line would lose their homes. They would have to move somewhere else.

(Some people say the land should be used to make more parks. These people say Newtown should have many open places to play and relax in.)*

(Other people think the land should be used for industry. Many industries might move to Newtown if they could build in the city. This would mean more jobs and money for the town.)*

The City Council does not know what to do.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

*indicates material not included in shorter version of story
** titled "Newtown" in final EDI.

Response Categories

1. Anti-Expressway

   General responses indicating "the last thing needed is more roads!" Sometimes, the use of alternate vehicles is advocated (bikes, etc.).

2. Parks

   Use the land for more parks.

3. Mass Transit

Use the land for mass transit systems (cut down on pollution, etc.)

4. Pro-Expressway

The land should be used for a new road, or the older ones should be widened.

5. Industries

Bring in new industries to town by offering them this land.

6. Various Other Solutions

Includes building a new road around the town.

7. Blank/No Solution

Category includes blanks, illegible answers, and factual restatements of the story without proposing any solutions. This category is included in all stories.

Frequency of Proposed Solutions To
Short and Long Story Versions
"Land Use"

SOLUTIONS PROPOSED		SHORT FORM	LONG FORM	TOTALS
Anti Expressway	N	24	12	36
	%	21.4	11.2	16.4
Parks	N	9.5	28	37.5
	%	8.5	26.2	17.1
Mass Transit	N	35.5	18.5	54
	%	31.7	17.3	24.6
Pro Expressway	N	18	14.5	32.5
	%	16.0	13.5	14.8
Industries	N	1	2	3
	%	.9	1.9	1.4
Various Other Solutions	N	15	14	29
	%	13.4	13.1	13.2
Blank/No Solution	N	9	18	27
	%	8.0	16.8	12.3
TOTALS	N	112	107	219
	%	51.1	48.9	100.00

Chi Square (5 df)=21.75
$p < .01$
Observer agreement=.98

Appendix I

Pilot Versions of

Our World of Today

Our World of Tomorrow

Some Ideas I Have

Stories About Real Life Problems

Name _____ CHECK ONE:

School _____ Boy ☐ Girl ☐

Grade ____ Date _____

OUR WORLD OF TODAY

OUR WORLD OF TOMORROW

Instructions:

We are interested in finding out what people your age think about "our world of today" and "our world of tomorrow". Knowing this can help teachers plan more interesting things to do in and outside school.

DON'T WORRY about right answers. There are NO right answers. Just write what you feel. Thank you for helping us.

Turn the page now to practice making your answers.

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Here you can practice to be sure you know the right way to tell us what you think. Let's look at the example below to see just how it should be done.

Suppose we want to know how you feel about SUMMER VACATION. The following pair of words can be used to tell how you feel about SUMMER VACATION.

fun ____:____:____:____:____ boring

If you feel that SUMMER VACATION is very much like one end of the scale, you should place your X like this;

fun __X__:____:____:____:____ boring

(This would mean you think summer vacation is a lot of fun.) OR you could place your X like this:

fun ____:____:____:____:__X__ boring

(This would mean you think summer vacation is very boring.)

If you feel that SUMMER VACATION is more like one or the other end of the scale, but not all the way, you should place your X like this:

fun ____:__X__:____:____:____ boring

or

fun ____:____:____:__X__:____ boring

If you think that SUMMER VACATION is just so-so or is neither fun or boring, then put your X right in the middle:

fun ____:____:__X__:____:____ boring

NOW, TRY A FEW YOURSELF:

fun ____:____:____:____:____ boring

sad ____:____:____:____:____ happy

bright ____:____:____:____:____ dull

If you have any questions, ask for help. If you understand how to mark this page, go on to the next page.

Now, forget about SUMMER VACATION. Tell us how you feel about OUR WORLD OF TODAY. The following words describe or tell about OUR WORLD OF TODAY. Put your X on each line just like you did for the practice page.

OUR WORLD OF TODAY

good ____:____:____:____:____ bad

dislike ____:____:____:____:____ like

neat ____:____:____:____:____ littered

crowded ____:____:____:____:____ roomy

valuable ____:____:____:____:____ worthless, cheap

gloomy ____:____:____:____:____ bright

sickening ____:____:____:____:____ healthful

pretty ____:____:____:____:____ ugly

imperfect ____:____:____:____:____ perfect

beautiful ____:____:____:____:____ ugly

sad ____:____:____:____:____ happy

pure ____:____:____:____:____ polluted

safe ____:____:____:____:____ dangerous

sweet-smelling ____:____:____:____:____ stinking

hazy ____:____:____:____:____ sunny

clean ____:____:____:____:____ dirty

unpleasant ____:____:____:____:____ pleasant

awful ____:____:____:____:____ nice

TURN THE PAGE.

Now, forget about OUR WORLD OF TODAY. Tell us how you feel about OUR WORLD OF TOMORROW. The following words can describe or tell about OUR WORLD OF TOMORROW. Put your X on each line just like you did for the other page.

OUR WORLD OF TOMORROW

neat	____:____:____:____:____	littered
safe	____:____:____:____:____	dangerous
pretty	____:____:____:____:____	ugly
dislike	____:____:____:____:____	like
sad	____:____:____:____:____	happy
valuable	____:____:____:____:____	worthless, cheap
awful	____:____:____:____:____	nice
gloomy	____:____:____:____:____	bright
beautiful	____:____:____:____:____	ugly
sickening	____:____:____:____:____	healthful
sweet-smelling	____:____:____:____:____	stinking
imperfect	____:____:____:____:____	perfect
hazy	____:____:____:____:____	sunny
clean	____:____:____:____:____	dirty
pure	____:____:____:____:____	polluted
unpleasant	____:____:____:____:____	pleasant
good	____:____:____:____:____	bad
crowded	____:____:____:____:____	roomy

Now, look over the last 2 pages. Make sure you put <u>one X on each line</u>.

THANK YOU.

Name_____

School_____ Check one: BOY ☐ GIRL ☐

Grade___Date_____

SOME IDEAS I HAVE

INSTRUCTIONS: We are interested in finding out what students think about some things. Knowing this can help teachers plan interesting things to do in and outside school. We will add up how your class feels, and then later on, you can see if your classmates feel like you do.

DON'T WORRY about right answers. There are no right answers. Just write what you feel. Thank you for helping us.

Turn the page now to practice making your answers.

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USOE Project Number 2-E-026
Grant Number OEG-5-72-0045 (509)

Here are some ideas. We would like to know how you feel about them. All you do is put an X in the box that says how you feel about each idea. The faces help tell how you feel.

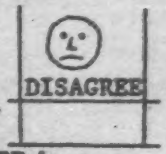
Here is a sample:	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
1. Going to school is fun.					

If you think the idea is very good, put your X in the STRONGLY AGREE box.

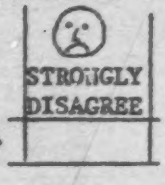
If the idea is O.K., but not real good, put your X in the AGREE box.

If you are not sure about this idea, put your X in the middle box, NOT SURE or DON'T KNOW.

If the idea is bad; but not real bad, put your X in the DISAGREE box.



If you think this idea is very bad, put your X in the STRONGLY DISAGREE box.



Now, put your X where you want it in number 1 above.

THEN, turn the page and practice marking some more of these ideas.

Practice marking the following ideas:

	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
1. Today is a sad day.					
2. We should have less homework every night.					
3. Roller-skating is more fun than swimming.					
4. I like to read books.					
5. Watching T.V. is boring.					

If you understand how to mark these ideas, START MARKING the ideas below. If you need help, raise your hand.

	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
1. From now on, people getting married should have no more than two children.					
2. We have enough parks and forests now for wild animals to live in.					
3. Motorbikes and motorcycles should be made quieter.					
4. It is O.K. for the number of people living in our country to get bigger.					
5. On a picnic, take paper plates and cups instead of plates and cups you can use over.					
6. I litter a lot.					
7. Walking in the woods is spoiled if too many people are there.					
8. Soon there may be too many people living on the earth.					
9. If my dad owned a marsh where ducks lived, I would like a playground built there.					

GO ON TO THE NEXT PAGE.

	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
10. There is too much on T.V. about pollution and the environment.					
11. Too much noise is not really a problem to worry about.					
12. I would be willing to keep people out of a park near my home, if wild animals needed a safe home there.					
13. We need more laws to help stop pollution.					
14. The best way to get rid of old newspapers is to burn them.					
15. There is not much one person can do to help the environment.					
16. I think I can help solve some pollution problems.					
17. It is important to learn about environmental problems in school.					
18. My neighborhood should be kept clean, even if I would have to pick up litter after school one day a week.					
19. If my car made too much air pollution, I would get it fixed.					
20. My family cannot do any more to help stop pollution.					
21. Don't waste the best T.V. time with programs about pollution.					
22. I think paper should be recycled (used over) even if I have to help collect it.					
23. Children worry too much about problems of the environment.					
24. Paper towels are better than cloth towels in a school washroom.					
25. Parents should have as many children as they want.					

GO ON TO THE NEXT PAGE.

	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
26. I like to hear a lot about environmental problems.					
27. If a city needs more homes for people, then build taller buildings. Don't use up land outside the city.					
28. Milk at school should come in bottles that can be used over, not paper cartons.					
29. Overpopulation (too many people) is the cause of many problems today.					
30. I feel responsible for causing some pollution.					
31. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.					
32. Sometimes people protesting about pollution can help as much as a law against pollution.					
33. We should do more to protect forests and wild animals.					
34. I do not worry very much about the environment.					
35. Soda pop should be sold only in bottles that can be used again, not in cans.					
36. I cannot find and help solve environmental problems around where I live.					
37. Pollution is the number one problem in our country.					

PLEASE TURN THE PAGE.

38. Here is a list of environmental problems. First, CIRCLE the ONE problem that you think is most important (only one problem, please). Then, CROSS OUT the ONE problem you think is not so important (only one problem, please). When you are done, there should be one problem with a circle around it, and one problem crossed out.

AIR POLLUTION
WATER POLLUTION
TOO MANY PEOPLE
CHEMICAL POLLUTION
NOISE POLLUTION
LEAVING SOME LAND ALONE

39. People have different ideas on who can help protect the environment, and stop pollution. Here is a list of people who might help. First, CIRCLE the one on the list that can help most. Circle only one. Then, CROSS OUT the one on the list that can help least (not help much). Cross out only one.

THE MAYOR
ME AND MY FRIENDS
THE PRESIDENT
PEOPLE WHO LIVE AROUND HERE
MY FAMILY
SCIENTISTS

+ + + + + + + + + + + + + + + + + +

Thank you for telling us your ideas. Now, would you please answer a few questions about what you have just done?

a. Was this easy to do? CHECK ONE: EASY___ NOT EASY, NOT HARD___ HARD___

b. Did you understand the directions? CHECK ONE: ALL___ MOST___ SOME, BUT NOT ALL ____

c. Were any of the words hard to understand? CHECK ONE: YES____ NO____

If YES, write the hard words here:_____

_____

d. Did you like telling us your ideas? CHECK ONE: YES___ NO___ IT WAS O. K.___

DO NOT PUT ANY

MARKS ON THIS

BOOK, PLEASE.

STORIES ABOUT REAL LIFE PROBLEMS

To the student: Please read the directions printed in the ANSWER BOOK.

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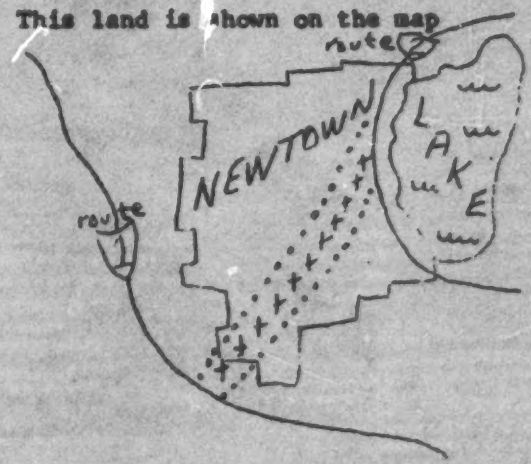
USOE Project Number 2-E-026 Grant Number OEG-5-72-0045(509)

STORY ONE

"Newtown"

Newtown is a city of 4 million people. It is a big city. It needs more factories, parks, homes and transportation (cars, roads and buses).

The city owns a long strip of land. This land is shown on the map between the two dotted (- - - - -) lines. The city is trying to decide how to use this land.



There are two highways near Newtown, route 1 and route 2. Some people say another highway should be built. The roads in Newtown are filled with cars every day. A new highway would help speed up traffic. But if the new road is built, some people living near the strip of land might lose their homes. They would have to move somewhere else.

Other people say more cars make more air pollution. They think that people should use buses and trains to go around Newtown. This would lower air pollution, traffic and noise. So, these people say use the land for train or bus routes.

Some people think the land should be used to make more parks. These people say Newtown needs many more open places to play and relax in.

Other people think the land should be used for factories. More factories would mean more jobs and money for the people in Newtown.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?
Tell us your ideas in the answer book.

The picture on the opposite page shows how a new highway would look in Newtown.

STORY TWO

"The School Tree"

Look at the picture of the tree on the opposite page. The land around it is used as a parking lot and playground for a school. The tree is the only one near the school. It gives shade, animals like it, and students like to play around it.

Some people say the tree should be cut down. They say it is dying. Dead tree limbs could fall and hurt someone. In winter, it takes more time to plow around the tree to take the snow off the playground. It would be faster to plow if the tree was cut down. These people say the tree is not worth the bother.

Other people say to keep the tree. They say it can get well again if the ground around the tree is broken up and more dirt is put there. That way the tree can get more air and water. These people say the tree is important to have around the school.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This picture shows the tree in the schoolyard.

STORY THREE

The Jackson family was talking over plans for a summer vacation.

"Could we go out West, Dad?" Tom asked. "There are some neat National Parks with lots of wilderness. You can see many mountains and lakes when you hike and camp."

"Those lakes might have some good fishing," said Tom's dad. "We could take the camping trailer along."

"Except there are no roads or big campgrounds, Dad," explained Tom. "If you really want to see the Park, you have to hike and camp. And sleep in tents."

Tom's mother and sister do not like to hike and camp. They like to see things from a car. But Tom and his dad enjoy hiking and camping.

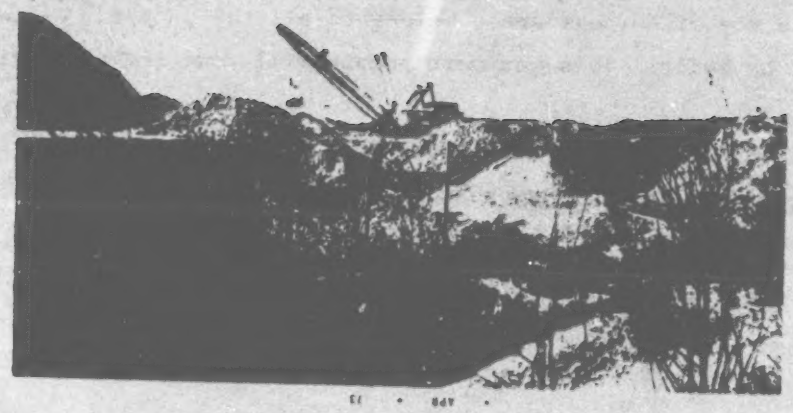
People don't agree on how National Parks should be used. Some people say that wilderness areas should be left alone. These people say that only hiking trails, not highways, should be built in wilderness areas.

Other people say wilderness areas belong to all the people. So more campgrounds and roads should be built. This way more people will come and enjoy the areas.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This is a picture of a family camping in a tent in a National Park.



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STORY FOUR

Sandy and her family live in Ohio. One Saturday she went with her dad to watch some strip mining.

"Strip mining is when big shovels scrape off the top part of the ground. This lets them get at the coal underneath," Sandy's dad explained.

"Don't they dig tunnels like in regular mines?" asked Sandy.

"No. As long as the coal is not too deep underground, it is cheaper to get it out this way," answered her dad.

Sandy remembered reading about strip mining. The book said it was cheaper and faster than digging a tunnel mine. It also gets more of the coal out of the ground than a tunnel mine.

Strip mines are safer for the people working there too. Tunnel mines can have fires deep in the earth. Strip mines cannot.

Burning the coal from strip mines makes a lot of electricity.

But to get this coal out, the land is turned upside down. Little can grow on the rocky hills after a place is strip mined. Animals lose their homes. Soil washes away into nearby streams.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This is a picture of the big shovel that Sandy saw. This place is being strip mined.

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STORY FIVE

One day, Tony and his friend Steve were walking along the river near a paper mill.

'Gosh, look at the funny color going into the river from that paper mill," said Tony.

"It sure is changing the water," Steve agreed.

Fish and other water animals cannot live in the water near the paper mill. Some people say the paper mill should stop dumping things into the water.

The owners say the mill is old. When it makes paper, it also makes water pollution. It would cost too much money to change the mill now.

Tony's father works at the mill. He says, "If they are told to stop polluting the river, the mill owners will close the paper mill instead."

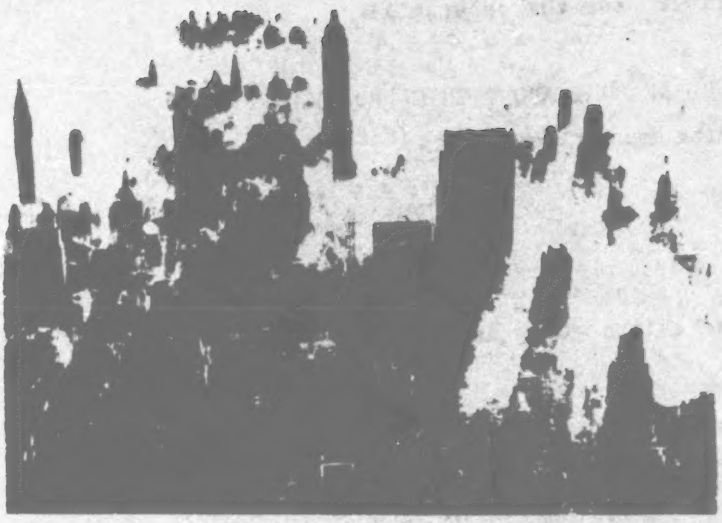
Many other people work at the paper mill. They spend the money they get from their jobs in the town. So the town needs the paper mill too.

But some other towns around there get water from the river too. They don't like the pollution in the river from the paper mill.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

The picture shows some of the things going into the river from the paper mill.



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STORY SIX

Jo Lynn, her mother and baby brother Timmy live near a big automobile plant in a large city. The family has no father. So Jo Lynn's mother works at the plant. Each day many cars are made there.

There is a lot of dirt in the area where Jo Lynn lives. Some people blame the auto plant for some of this. They say the dirt in the air comes from there. They say the plant owners should stop putting dirt into the air.

The plant owners say stopping air pollution would cost too much. They would have to get higher prices for the new cars made in the plant. What if the people could not pay the higher prices? They cars would not be sold. Then the auto plant would have to close.

Jo Lynn's mother needs a job. She has to work to get money for Jo Lynn and Timmy.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?
Tell us your ideas in the answer book.

The picture shows the city where Jo Lynn and her family live.

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STORY SEVEN

"Freeland"

You live in a country called Freeland. Each year there are many more people in Freeland than the year before. Last year, there were 2,000 people. This year there are 3,000 people. Next year, people think there will be 4,000 people. Here are some pictures which show how the number of people in Freeland is changing:

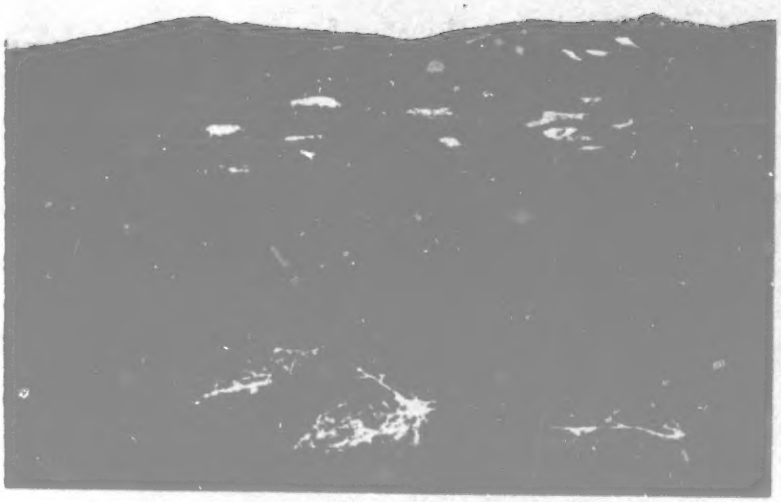
Some people say having more people in Freeland is good for the country. More people can build more things. Freeland could make money selling these things to other countries. So then Freeland could have nicer homes, parks, schools, and so on.

Other people say Freeland will soon be too crowded. There might not be enough food. People could be too crowded together. Then living in Freeland would not be so nice.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This picture shows some of the children who live in Freeland.



STORY EIGHT

"Clear-cutting"

Jim's family was visiting a big National Forest on their vacation.

"Hey, dad, what are all those holes in the forest?" Jim asked.

"Those aren't holes, Jim," answered his father. "Those are places where lumber companies have cut down all the trees. They call it clear-cutting."

"Why do they cut down all the trees?" Jim wondered.

Jim's father said that lumber companies rent some of the land from the government. The companies say that cutting down all the trees in one place saves money. It is faster and less work. If only some of the trees were cut, it would take more time to get them out of the forest. The lumber companies also say some kinds of trees that make good lumber grow better when clear-cutting is used.

Jim thought, "I guess we do need lumber. The more people there are, the more lumber we need to build houses and things."

Other people say that clear-cutting ruins the homes of many animals like squirrels and chipmunks. When all the trees are cut down, soil can be washed away easier. These people say the clear-cut places in the forest look ugly.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

The open spots in this picture are places that have been clear-cut.

STORY NINE

"Smithville"

Donna and Carol live in a small town called Smithville. On their way home from school, they pass the only factory in town. Donna's father works at the factory.

"Boy, look at all the smoke coming out of that chimney," said Carol. "It sure makes the air smelly. Maybe the owner should be told to stop all that dirt from going into the air."

"My dad said the owner would close the factory if he had to stop all that smoke," Donna said. "He can't afford to stop the smoke."

But the air pollution coming from the factory is smelly and dirty. A lot of it could make you sick. Many visitors to Smithville think the air is not clean.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This is a picture of the only factory in Smithville.

STORY TEN

"Cedar City"

Linda and her family live in Cedar City. On the way to school one day, Linda saw a lot of cans, bottles and other things lying around. She saw them in vacant lots, in the river and around the park.

That day her teacher talked about this problem. "Cedar City has grown over the last few years," said the teacher. "This means more garbage to get rid of."

Some people say the local company that makes soda pop is partly to blame. They are selling soda pop in cans and throw-away bottles. These quickly become garbage. Some people say it would be better for the soda pop company to sell soda in returnable bottles. These bottles could be used over and over again, not just once.

The soda pop company says that supermarkets in Cedar City do not like returnable bottles. They take up too much space. It is easier and cheaper for supermarkets to sell soda pop in cans and throw-away bottles.

Some people want a law to stop the selling of soda pop in cans and throw-away bottles in Cedar City.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

Name_____

School_____ Circle one: BOY GIRL

Grade____ Date_____

ANSWER BOOK FOR

"STORIES ABOUT REAL LIFE PROBLEMS"

INSTRUCTIONS: Today you will read about some real life problems. Then you can tell us your ideas about each problem in this answer book. But DON'T WORRY about right answers. There are NO right answers. Just tell us what you feel. Turn the page now to see how to tell us your ideas.

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USOE Project number 2-E-026
Grant Number OEG-5-72-0045(509)

On the next pages, there are some student's ideas on how to solve some problems. The students read about these problems in the book STORIES ABOUT REAL LIFE PROBLEMS.

We would like to know how you feel about the ideas the students wrote. Telling us how you feel is easy. Here is all you do:

FIRST, read a story in the book STORIES ABOUT REAL LIFE PROBLEMS. Look at the picture which helps tell the story. THEN read all the ideas about the story. The ideas are in this answer book. Decide which idea you feel would be the BEST way to solve the problem. Mark it with a 1. Mark the other ideas with a 2 if they are second-best, or a 3 if they are third-best, and so on.

YOU PUT A NUMBER BY EVERY IDEA TO TELL HOW MUCH YOU LIKE IT.

Remember: 1 means the BEST idea
2 means the second-best idea
3 means the third-best idea
and so on.

EVERY IDEA GETS A NUMBER.

Now, turn the page to practice telling us your ideas.

Read the FIRST story in the book called STORIES ABOUT REAL LIFE PROBLEMS. The story is about Newtown. THEN, follow the directions below.

Here are some student's ideas on solving this problem. Read all the ideas first. Then mark each idea with a number to tell how much you like it. Remember, number 1 means the best idea.

IDEAS ABOUT NEWTOWN (story 1):

1. Don't use the land for another highway. There are enough roads now. NUMBER_____

2. Use the land for train or bus routes. NUMBER_____

3. Newtown needs more parks for people to relax in. Use the land for parks. NUMBER_____

4. Use the land for factories which don't pollute. Jobs and money are important for Newtown. NUMBER_____

5. If I lived there, I could help solve this problem. (Circle one) YES NO

STOP.

Now read the story about the "School Tree". It is story TWO in your book.

Here are some student's ideas on solving this problem. Read all the ideas first. Then mark each idea with a number to tell how much you like it. Remember, number 1 means the best idea.

IDEAS ABOUT THE SCHOOL TREE (story 2):

6. Cut the tree down before someone gets hurt. One tree is not important. NUMBER_____

7. Help the tree get healthy again. And move the parking lot somewhere else. NUMBER_____

8. Block off part of the parking lot around the tree. NUMBER_____

TURN THE PAGE.

Do you have any ideas about how to solve the problem of the School Tree? If you do, write them here: _____

_____

_____

STOP.

Now read story THREE in your book. It is about wilderness.

_____

Some students wrote their ideas on solving this problem. Read all the ideas first. Then give each idea a number which tells how much you like it. (1 is best)

IDEAS ABOUT WILDERNESS (Story 3):

9. The most important thing in this story is for the Jackson family to decide whether they should camp or not. NUMBER_____

10. Wilderness areas are beautiful. They would be ruined by more roads and campgrounds. NUMBER_____

11. Wilderness belongs to all the people. Build more roads and campgrounds so more people can enjoy them. NUMBER_____

12. Wilderness areas should not have a lot of people in them. So leave wilderness just for hiking. NUMBER_____

13. Build more roads and campgrounds in some Parks. Save others just for hiking. NUMBER_____

14. I think I could help solve this problem. (Circle one) YES NO

STOP.

Now read story FOUR in your book. It is about strip mining.

_____

On the next page are some student's ideas on solving this problem. Read all the ideas first. Then give each idea a number which tells how much you like it. Remember, 1 means the best idea.

TURN THE PAGE.

IDEAS ABOUT STRIP MINING (story 4):

15. The most important reason to stop strip mining is to save animal's homes. NUMBER_____

16. Stop all strip mining. It ruins the land. Use tunnel mines instead. NUMBER_____

17. Keep strip mines. We need the coal from them. They are safer than tunnel mines. NUMBER_____

18. Only use strip mines in some places. Fill in the land afterward. NUMBER_____

19. If I lived there, I could help solve this problem. (circle one) YES NO

STOP.

Now read story FIVE in your book. It is about water pollution.

Some students wrote their ideas on solving this problem. Read all the ideas first. Then give each idea a number which tells how much you like it. (1 means best)

IDEAS ABOUT WATER POLLUTION (story 5):

20. Water pollution must be stopped. Close the mill if you have to. NUMBER_____

21. Put the mill away from the water. Dump stuff somewhere else. NUMBER_____

22. The town should help the mill get money to stop the pollution. NUMBER_____

23. Put in a filter to stop the pollution. NUMBER_____

24. If I lived there, I could help solve this problem. (circle one) YES NO

STOP.

Please read story SIX in your book. It is about air pollution.

Some students wrote their ideas on solving this problem. Read all the ideas first. Then, put a number next to each idea which tells how much you like it. Remember, 1 means the best idea.

TURN THE PAGE FOR THE IDEAS.

IDEAS ABOUT AIR POLLUTION (story 6):

25. Get a machine which keeps dirt out of the air. NUMBER_____

26. Shut down the factory to stop the pollution. NUMBER_____

27. The best way to solve the problem is for Jo Lynn's family to move away, or her mother get another job. NUMBER_____

28. Raise car prices to pay for something to keep the air clean. NUMBER_____

29. If I lived there, I could help solve this problem. (circle one) YES NO

STOP.

Now read the next story in your reader. It is story SEVEN, about a country called Freeland.

Here are what some students said about solving this problem. Read all the ideas first. Then, put a number next to each idea which tells how much you like it. Remember, 1 mean the best idea.

IDEAS ABOUT FREELAND (story 7):

30. This is not really a problem. There is plenty of land outside of cities for people to live on. NUMBER_____

31. Start a program to get parents to have smaller families. NUMBER_____

32. Move extra people to the moon and other planets. NUMBER_____

33. Stop all medicines. Some people will get sick and die. This will help solve the problem. NUMBER_____

34. Grow more food for the people, or buy food from other countries. NUMBER_____

35. If I lived there, I could help solve this problem. (circle one) YES NO

TURN THE PAGE, PLEASE.

Do you have any ideas about how to solve the problem in Freeland? If you do, write them here: _____

_____

_____

STOP.

Now, please read the story about Clear-Cutting in your book. It is story EIGHT.

_____

Here are some student's ideas on solving this problem. Read all the ideas first. Then, mark each with a number to tell how much you like it. (1 means best)

IDEAS ABOUT CLEAR-CUTTING (story 8):

36. Watch out for animals, but it is O.K. to clear-cut. We need lumber that costs less. NUMBER_____

37. Stop the clear-cutting. It ruins too many things. Get lumber some other way. NUMBER_____

38. Only clear-cut <u>some</u> places in the forest. Then plant new trees. NUMBER_____

39. I <u>cannot</u> help much to solve this problem. (circle one) YES NO

STOP.

Now read story NINE in your reader. It is about Smithville.

_____

On the next page are what some students wrote about solving this problem. Read all their ideas first. Then mark each idea with a number which tells how much you like it. Remember, number 1 means the best idea.

TURN THE PAGE FOR THE IDEAS ABOUT SMITHVILLE.

IDEAS ABOUT SMITHVILLE (story 9):

40. Keep the factory open. Jobs are more important than a little air pollution. NUMBER_____

41. The best thing to do is for Donna's father to get another job, or the family move away. NUMBER_____

42. Put a filter on the chimney to stop the smoke. NUMBER_____

43. The town should help the owner raise money to stop the smoke. NUMBER_____

44. If I lived there, I could help solve this problem. Circle one: YES NO

STOP.

Now read the last story in your reader (story TEN). It is about Cedar City.

Here are some student's ideas on solving this problem. Read all the ideas first.

Then mark each idea with a number which tells how much you like it. (1 is best)

IDEAS ABOUT CEDAR CITY (story 10):

45. Only use bottles you can return. No cans or throw-away bottles. NUMBER_____

46. The best way to solve the problem is to stop throwing trash around. Put it in garbage cans or waste baskets. NUMBER_____

47. Pass a law to fine people who litter. NUMBER_____

48. If I lived there, I could help solve this problem. (circle one) YES NO

---

49. Think about where you live. This means your home, your school and the other nearby places you sometimes go to. Do you think there are any problems around here like the ones you read about?

Circle one: YES NO

PLEASE TURN THE PAGE.

Name_____

School_____ Circle one: BOY GIRL

Grade____Date_____

ANSWER BOOK FOR

"STORIES ABOUT REAL LIFE PROBLEMS"

INSTRUCTIONS: Today you will read about some real life problems. Then you can tell us your ideas about each problem in this answer book. But DON'T WORRY about right answers. There are NO right answers. Just tell us what you feel. Turn the page now to see how to tell us your ideas.

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Grant Number OEG-5-72-0045(509)

On the next pages, there are some student's ideas on solving each problem in STORIES ABOUT REAL LIFE PROBLEMS. We would like to know how you feel about these ideas. All you do is put an X in the box that says how you feel about each idea. The faces help tell how you feel.

Here is a sample:

IDEA ABOUT THE STORY.	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
The people in the story should solve the problem.					

FIRST, you read the story about this problem in the book called STORIES ABOUT REAL LIFE PROBLEMS. Then you read the ideas about the story in this answer book. Decide what you feel about each way of solving the problem. Then, for each idea, put your X in the ONE box which tells how you feel about that idea.

If you like the idea a lot, put your X in the box marked STRONGLY AGREE.

If you like the idea a little bit, put your X in the box marked AGREE.

If you are not sure about this idea, put your X in the middle box, NOT SURE or DON'T KNOW.

If you kind of DON'T like the idea, put your X in the DISAGREE box.

If you don't like the idea at all, put your X in the STRONGLY DISAGREE box.

Now, turn the page to practice telling us your ideas.

Practice marking the following ideas: Just put your X in the ONE box that tells how you feel about each idea.

IDEAS	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
We should have less homework every night.					
Roller-skating is more fun than swimming.					
Reading books is a lot of fun.					
Watching T.V. is boring.					

If you have any questions, raise your hand.

If you understand how to tell us your ideas, than you can start.

READ the FIRST story in the book called STORIES ABOUT REAL LIFE PROBLEMS. The story is about "Newtown". Then, follow the directions below.

Here are some student's ideas on solving this problem. Read all the ideas first. Then, mark each idea with an X in the box which says how you feel about the idea.

IDEAS ABOUT NEWTOWN (story 1):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
1. Don't use the land for another highway. There are enough roads now.					
2. Use the land for train or bus routes.					
3. Newtown needs more parks for people to relax in. Use the land for parks.					
4. Use the land for factories which don't pollute. Jobs and money are important for Newtown.					

5. If I lived there, I could help solve this problem. Circle one: YES NO

STOP.

Now, read the story about "The School Tree". It is story TWO in your book. When you finish reading, turn this page.

Here are some student's ideas on solving the problem. Read all the ideas first.

Then, mark each idea with an X in the box which says what you feel about the idea.

IDEAS ABOUT THE SCHOOL TREE (Story 2):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
6. Cut the tree down before someone gets hurt. One tree is not important.					
7. Help the tree get healthy again. And move the parking lot somewhere else.					
8. Block off part of the parking lot around the tree.					

Do you have any ideas about how to solve the problem of "The School Tree"? If you do, write them here: _____

_____

_____

STOP.

Now read story THREE in your book. It is about wilderness.

_____

Some students wrote their ideas on solving this problem. Read all the ideas first.

Then mark each idea with an X in the box which says what you feel about the idea.

IDEAS ABOUT WILDERNESS (Story 3):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
9. The most important thing in this story is for the Jackson family to decide whether to go camping or not.					
10. Wilderness areas are beautiful. They would be ruined by more roads and campgrounds.					
11. Wilderness belongs to all the people. Build more roads and campgrounds so more people can enjoy them.					

TURN THE PAGE FOR MORE IDEAS ABOUT WILDERNESS.

MORE IDEAS ABOUT WILDERNESS:	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
12. Wilderness areas should not have a lot of people in them. So leave wilderness just for hiking.					
13. Build more roads and campgrounds in some Parks. Save others just for hiking.					

14. I think I could help solve this problem. Circle one: YES NO

STOP.

Now read story FOUR in your book. It is about strip mining.

Here are some student's ideas on solving this problem. Read all the ideas first.

Then put your X in the box which says what you feel about each idea.

IDEAS ABOUT STRIP MINING (Story 4):	STRONGLY AGREE	AGREE	DON'T KNOW, NOT SURE	DISAGREE	STRONGLY DISAGREE
15. The most important reason to stop strip mining is to save animal's homes.					
16. Stop all strip mining. It ruins the land. Use tunnel mines instead.					
17. Keep strip mines. We need the coal from them. They are safer than tunnel mines.					
18. Only use strip mines in some places. Fill in the land afterward.					

19. If I lived there, I could help solve this problem. Circle one: YES NO

STOP.

Now read story FIVE in your book. It is about water pollution. When you finish reading, turn this page.

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Some students wrote their ideas on solving this problem. Read all the ideas first.

Then mark each idea with an X in the box which tells what you feel about the idea.

IDEAS ABOUT WATER POLLUTION (Story 5):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
20. Water pollution must be stopped. Close the mill if you have to.					
21. Put the mill away from the water. Dump stuff somewhere else.					
22. The town should help the mill get money to stop the pollution.					
23. Put in a filter to stop the pollution.					

24. If I lived there, I could help solve this problem. Circle one: YES NO

STOP.

Please read story SIX in your book. It is about air pollution.

Some students wrote their ideas on solving this problem. Read all the ideas first. Then, mark each idea with an X in the box which says what you feel about it.

IDEAS ABOUT AIR POLLUTION (Story 6):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
25. Get a machine which keeps dirt out of the air.					
26. Shut down the factory to stop the pollution.					
27. The best way to solve the problem is for Jo Lynn's family to move away, or her mother get another job.					

TURN THE PAGE FOR MORE IDEAS ABOUT AIR POLLUTION.

MORE IDEAS ABOUT AIR POLLUTION:	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
28. Raise car prices to pay for something to keep the air clean.					

29. If I lived there, I could help solve this problem. Circle one: YES NO

STOP.

Now read the next story in your reader. It is story SEVEN, about a country called Freeland.

Here are what some students said about solving this problem. Read all the ideas first. Then, mark each idea with an X like for the others you have done.

IDEAS ABOUT FREELAND (story 7):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
30. This is not really a problem. There is plenty of land outside of cities for people to live on.					
31. Start a program to get parents to have smaller families.					
32. Move extra people to the moon and other planets.					
33. Stop all medicines. Some people will get sick and die. This will help solve the problem.					
34. Grow more food for the people, or buy food from other countries.					

35. If I lived there, I could help solve this problem. Circle one: YES NO

Do you have any ideas about how to solve the problem in Freeland? If you do, write them here: _____

_____

_____

_____

Now, please read the story about Clear-Cutting in your book. It is story EIGHT.

Here are some student's ideas on solving this problem. Read all the ideas first.

Then mark each with an X in the box which tells how you feel about the idea.

IDEAS ABOUT CLEARCUTTING (Story 8):	STRONGLY AGREE	AGREE	DON'T KNOW, NOT SURE	DISAGREE	STRONGLY DISAGREE
36. Watch out for animals, but it is O.K. to clear-cut. We need lumber that costs less.					
37. Stop the clear-cutting. It ruins too many things. Get lumber some other way.					
38. Only clear-cut some places in the forest. Then plant new trees.					

39. I cannot help much to solve this problem. Circle one: YES NO

STOP.

Now read story NINE in your reader. It is about Smithville.

Here are some student's ideas on solving this problem. Read all the ideas first.

Then mark each idea with an X in the box which says what you feel about the idea.

IDEAS ABOUT SMITHVILLE (Story 9):	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
40. Keep the factory open. Jobs are more important than a little air pollution.					
41. The best thing to do is for Donna's father to get another job, or the family move away.					

TURN THE PAGE FOR MORE IDEAS ABOUT SMITHVILLE.

MORE IDEAS ABOUT SMITHVILLE:	STRONGLY AGREE	AGREE	NOT SURE, DON'T KNOW	DISAGREE	STRONGLY DISAGREE
42. Put a filter on the chimney to stop the smoke.					
43. The town should help the owner raise money to stop the smoke.					

44. If I lived there, I could help solve this problem. Circle one: YES NO

STOP.

Now read the last story in your reader (story TEN). It is about Cedar City.

Here are some student's ideas on solving this problem. Read all the ideas first.

Then mark each idea with an X in the box which says what you feel about the idea.

IDEAS ABOUT CEDAR CITY (Story 10):	STRONGLY AGREE	AGREE	DON'T KNOW, NOT SURE	DISAGREE	STRONGLY DISAGREE
45. Only use bottles you can return. No cans or throw-away bottles.					
46. The best way to solve the problem is to stop throwing trash around. Put it in garbage cans or waste baskets.					
47. Pass a law to fine people who litter.					

48. If I lived there, I could help solve this problem. Circle one: YES NO

---

49. Think about where you live. This means your home, your school and the other nearby places you sometimes go to. Do you think there are any problems around here like the ones you read about?

Circle one: YES NO

PLEASE TURN THE PAGE.

Appendix J

Field Test Versions of

Our World of Today

Our World of Tomorrow

Some Ideas I Have

Stories About Real Life Problems

Name_____

School_____

Grade____Date_____

CHECK ONE:

Boy ☐ Girl ☐

OUR WORLD OF TODAY

OUR WORLD OF TOMORROW

Instructions:

We are interested in finding out what people your age think about "our world of today" and "our world of tomorrow". Knowing this can help teachers plan more interesting things to do in and outside school.

DON'T WORRY about right answers. There are NO right answers. Just write what you <u>feel</u>. Thank you for helping us.

Turn the page now to practice making your answers.

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Here you can practice the right way to tell us what you think. Let's look at the example below to see how it should be done.

Suppose we want to know how you feel about SUMMER VACATION. The following pair of words can tell how you feel about SUMMER VACATION.

fun _____:_____:_____:_____:_____ boring

If you feel that SUMMER VACATION is very much like one word of the pair, put your X right next to that word.

fun __X__:_____:_____:_____:_____ boring
(This would mean you think summer vacation is a lot of fun.) OR you could place your X like this:

fun _____:_____:_____:_____:__X__ boring
(This would mean you think summer vacation is very boring.)

If you feel that SUMMER VACATION is more like one of the words, but not exactly like it, you should place your X near it, but in the second space:

fun _____:__X__:_____:_____:_____ boring
(This would mean you think summer vacation is a little fun.) OR you could put your X here:

fun _____:_____:_____:__X__:_____ boring
(This would mean you think summer vacation is a little boring.)

If you think that SUMMER VACATION is just so-so or is neither fun or boring, then put your X right in the middle space:

fun _____:_____:__X__:_____:_____ boring

NOW, TRY A FEW YOURSELF:

SUMMER VACATION

fun _____:_____:_____:_____:_____ boring

sad _____:_____:_____:_____:_____ happy

bright _____:_____:_____:_____:_____ dull

bad _____:_____:_____:_____:_____ good

If you have any questions, ask for help. If you understand how to mark this page, go on to the next page.

Now, forget about SUMMER VACATION. Tell us how you feel about OUR WORLD OF TODAY. The following pairs of words describe or tell about OUR WORLD OF TODAY. Think about each pair of words: then put your X in the space on each line to tell how you feel about OUR WORLD OF TODAY.

OUR WORLD OF TODAY

ugly ____:____:____:____:____ pretty

littered ____:____:____:____:____ neat

bad ____:____:____:____:____ good

sweet-smelling ____:____:____:____:____ stinking

pleasant ____:____:____:____:____ unpleasant

hazy ____:____:____:____:____ sunny

healthful ____:____:____:____:____ sickening

awful ____:____:____:____:____ nice

clean ____:____:____:____:____ dirty

safe ____:____:____:____:____ dangerous

TURN THE PAGE.

Now, forget about OUR WORLD OF TODAY. Tell us how you feel about OUR WORLD OF TOMORROW. The following pairs of words can describe or tell about OUR WORLD OF TOMORROW. Think about each pair of words. Then put your X in the space on each line to tell how you feel about OUR WORLD OF TOMORROW.

OUR WORLD OF TOMORROW

sickening ____:____:____:____:____ healthful

dirty ____:____:____:____:____ clean

sunny ____:____:____:____:____ hazy

nice ____:____:____:____:____ awful

unpleasant ____:____:____:____:____ pleasant

bad ____:____:____:____:____ good

littered ____:____:____:____:____ neat

sweet-smelling ____:____:____:____:____ stinking

pretty ____:____:____:____:____ ugly

safe ____:____:____:____:____ dangerous

Now, look over the last 2 pages. Make sure you put <u>one X on each line</u>.

218 THANK YOU.

DO NOT PUT ANY MARKS ON

THIS COPY, PLEASE.

SOME IDEAS I HAVE

INSTRUCTIONS: We are interested in finding out what students think about some things. Knowing this can help teachers plan interesting things to do in and outside school.

DON'T WORRY about right answers. There are NO right answers. Just write what you feel. Thank you for helping us.

Turn the page now to see how to tell us your ideas.

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Grant Number OEG-3-72-0045 (509)

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Here are some ideas. We would like to know how you feel about them. Read each idea on the following pages. Decide how you feel about it. Then go to the answer sheet and find the idea's number. Put your X in the box which says how you feel about that idea. (The faces help tell how you feel.)

HERE IS A SAMPLE IDEA:

1. Going to school is fun.

If you think the idea is very good, put your X in the STRONGLY AGREE box on the answer sheet.

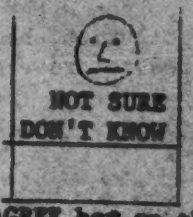
The box looks like this

If the idea is O.K., but not real good, put your X in the AGREE box on the answer sheet.

The box looks like this

If you are not sure about this idea, put your X in the middle box, NOT SURE or DON'T KNOW.

The box looks like this

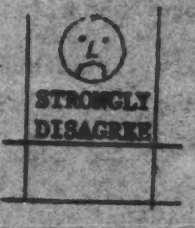


If the idea is bad, but not real bad, put your X in the DISAGREE box on the answer sheet.

The box looks like this

If you think this idea is very bad, put your X in the STRONGLY DISAGREE box on the answer sheet.

The box looks like this



Now, decide what you feel about this sample idea. Put your X in one of the boxes next to number 1 on the answer sheet. Then, turn the page to read some more ideas.

Read each idea below. Find its number on the answer sheet. Then put an X in the ONE box which says how you feel about it. (If you need help for any idea, raise your hand.)

IDEAS:

2. We should have less homework every night.

3. I worry about the environment (problems like pollution).

4. From now on, people getting married should have no more than two children.

5. I cannot find and help solve environmental problems around where I live.

6. Soon there may be too many people living on the earth.

7. Protesting about pollution helps to make things better.

8. If a person's car makes too much air pollution, he should not be allowed to drive it.

9. Gym class is the best class in school.

10. The cause of many problems in the world today is too many people.

11. I want my neighborhood kept clean. Everyone should pick up his own litter. I should not have to pick up someone else's mess.

12. Too much noise is really a problem to worry about.

13. Usually, it is best to write on just one side of a piece of paper.

14. There is too much writing in school.

GO TO THE NEXT COLUMN.

MORE IDEAS:

15. I like to hear a lot about environmental problems like pollution.

16. I think there are a lot of pollution problems I can help stop.

17. Soda pop should be sold only in bottles that can be used again, not in cans.

18. Don't waste the best T.V. time with programs about pollution.

19. I would get rid of old newspapers by burning them. This is an easy way.

20. Walking in the woods is not as much fun if too many people are there.

21. Roller-skating is more fun than swimming.

22. If wild animals need a safe home, it would be best to put them in a nice zoo.

23. Milk at school should come in bottles that can be used over, not paper cartons.

24. Parents should have as many children as they want.

25. If my dad owned a marsh or woods where some animals lived, I would like part of it made into a playground (like at school).

26. I like to read books.

221 GO ON TO THE NEXT PAGE, PLEASE.

Mark the answer sheet for each idea on this page just like you did for the last page.

MORE IDEAS:

27. There is too much on T.V. about problems with pollution.

28. Children worry too much about problems of the environment (like pollution problems.)

29. Motorbikes and motorcycles should be made more quiet.

30. People(like me) are the cause of most pollution problems.

31. We have enough parks and forests now for wild animals to live in.

32. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.

33. Listening to music is boring.

34. There is not much <u>one</u> person can do to help the environment and stop pollution.

35. It is O.K. for the number of people living in our country to increase. (This means more people would live here.)

MARK

ALL

ANSWERS

ON THE

ANSWER SHEET.

---

36. Here is a list of problems. First, pick out ONE problem you think is most important (only one problem, please). Write its letter on the answer sheet. Then, pick out ONE problem that is <u>not</u> as important. Write its letter on the answer sheet.

A. CHEMICAL POLLUTION
B. WATER POLLUTION
C. TOO MANY PEOPLE
D. AIR POLLUTION
E. NOISE POLLUTION
F. LEAVING SOME LAND ALONE

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Go on to the next page, please.

37. People have different ideas on who can help protect the environment, and stop pollution. Here is a list of people who might help. First, pick out ONE from the list that could help most. (only one, please) Write its letter on the answer sheet. Then, pick out ONE from the list who could not help much. Write its letter on the answer sheet.

A. ME AND MY FRIENDS
B. SCIENTISTS
C. THE MAYOR
D. PEOPLE WHO LIVE AROUND HERE
E. THE PRESIDENT
F. MY FAMILY

THANK YOU FOR HELPING US.

Answer Sheet for
"Some Ideas I Have"

NAME: _____

Directions: Put your X in the ONE box which says how you feel about each idea.

IDEA NUMBER	STRONGLY AGREE	AGREE	DON'T KNOW/ NOT SURE	DISAGREE	STRONGLY DISAGREE
1. (sample)					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					

TURN OVER.

IDEA NUMBER	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					
31.					
32.					
33.					
34.					
35.					

36. MOST IMPORTANT PROBLEM: letter_____

LEAST (NOT AS) IMPORTANT PROBLEM: letter_____

37. WHO COULD HELP MOST letter_____

WHO COULD NOT HELP MUCH: Letter_____

PLEASE GO BACK NOW AND CHECK ALL YOUR ANSWERS. BE SURE YOU HAVE NOT SKIPPED ANY IDEAS. ALSO CHECK TO SEE THAT YOU PUT YOUR X IN ONLY ONE BOX FOR EVERY IDEA. THANK YOU.

DO NOT PUT ANY

MARKS ON THIS

BOOK, PLEASE.

STORIES ABOUT REAL LIFE PROBLEMS

To the student: Please read the directions printed in the ANSWER BOOK.

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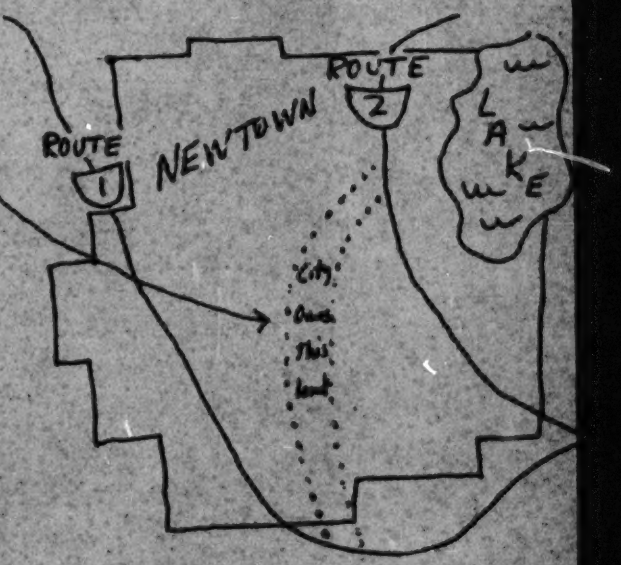
STORY ONE

"Newtown"

Newtown is a city of 4 million people. It is a big city. It has factories, parks, homes and transportation (cars, roads and buses). The city owns a long strip of land. This land is shown on the map between the two dotted lines. The city is trying to decide how to use this land.



There are two highways near Newtown, route 1 and route 2. Some people say another highway should be built. The roads in Newtown are filled with cars everyday. A new highway would help speed up traffic in the city. But if a new road is built, some people living near the strip of land might lose their homes. They would have to move somewhere else.

Other people say more cars make more air pollution. They think that people should use buses and trains to go around Newtown. This would lower air pollution, traffic and noise. So, these people say use the land for train or bus routes.

This is how a new highway would look in Newtown.

Some people think the land should be used to make more parks. These people say Newtown needs many more open places to play and relax in.

Other people think the land should be used for factories. More factories would mean more jobs and money for the people in Newtown.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM? Tell us in the answer book.

STORY TWO

"The School Tree"

Look at the picture of the tree. The land around it is used as a parking lot and playground for a school. Cars park there everyday. The tree is the only one near the school. It gives shade, animals live in it, and students like to play around it.

This is the tree in the schoolyard and parking lot.

Some people say the tree should be cut down. They say it is dying from bad treatment. Dead tree limbs could fall and hurt someone. In winter, it takes more time to plow around the tree to take the snow off the parking lot and playground. It would be faster to plow if the tree was cut down. These people say the tree is not worth the bother.

Other people say to keep the tree. They say people and cars are pressing the dirt down around the tree. If the ground around the tree is broken up, and more dirt put in, the tree can get healthy again. These people say the tree is important to have around the school.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

STORY THREE

"Wilderness"

The Jackson family was talking over plans for a summer vacation.

"Could we go out West, Dad?" Tom asked. "There are some neat National Parks with lots of wilderness. You can see many mountains and lakes when you hike and camp."

"Those lakes might have some good fishing," said Tom's dad. "We could take the camping trailer along."

"Except there are no roads or big campgrounds, Dad," explained Tom. "If you really want to see the place, you have to hike and camp. And sleep in tents."

Tom's father and mother do not like to hike and camp. They like to see things from a car. But Tom and his sister enjoy hiking and camping.

People don't agree on how National Parks should be used. Some people say that wilderness areas should be left alone. Plants and animals living there should not be disturbed. These people say that only hiking trails, not highways, should be built in wilderness areas.

Other people say wilderness areas belong to all the people. So more campgrounds and roads should be built. There should be more places for big camping trailers. This way more people will come and enjoy the areas.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This is a picture of a family camping in a tent in a National Park.

STORY FOUR

"Strip Mining"

Sandy and her family live in Ohio. One Saturday she went with her dad to watch some strip mining.

"Strip mining is when big shovels scrape off the top part of the ground. This lets them get at the coal underneath," Sandy's dad explained.

"Don't they dig tunnels like in regular mines?" asked Sandy.

"No. As long as the coal is not too deep under the ground, it is cheaper to get it out this way," answered her dad.

This is a picture of the big shovel that Sandy saw. This place is being strip mined.

Sandy remembered reading about strip mining. The book said it was cheaper and faster than digging a tunnel mine. It also gets more of the coal out of the ground than a tunnel mine.

Strip mines are safer for the people working there too. Tunnel mines can have fires deep in the earth. Strip mines cannot.

Burning the coal from strip mines makes a lot of electricity.

But to get this coal out, the land is turned upside down. Little can grow on the rocky hills after a place is strip mined. Animals lose their homes. Soil washes away into nearby streams.

Strip mine owners say they could fix up the land after getting the coal out. But this would cost a lot of money. People buying the coal would have to pay more for it.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

STORY FIVE

"The Paper Mill"

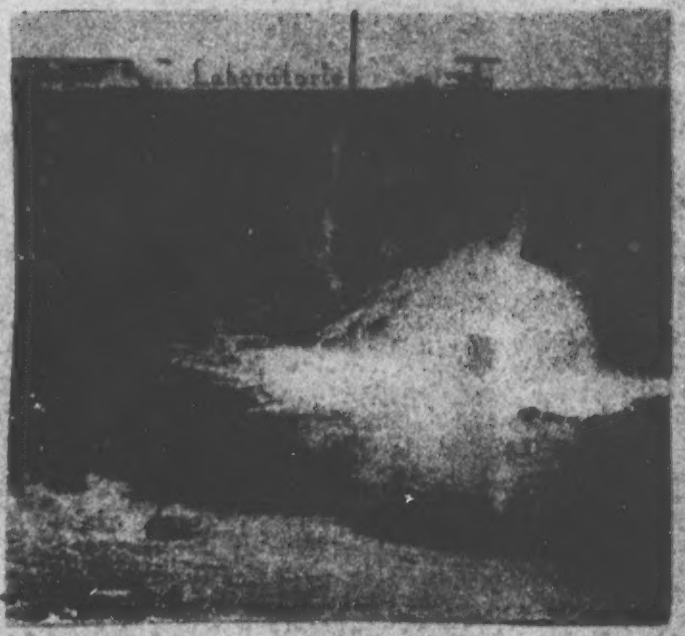
One day, Tony and his friend Steve were walking along the river near a paper mill.

"Gosh, look at the funny colored stuff going into the river from that paper mill," said Tony.

"It sure is changing the water," Steve agreed.

Fish and other water animals cannot live in the water near the paper mill. Some people say the paper mill should stop dumping this stuff into the water.

The owners say the mill is old. When it makes paper, it also makes water pollution. It would cost too much money to change the mill now.



The picture shows what the paper mill is putting into the river.

Tony's father works at the mill. He says, "If they are told to stop polluting the river, the mill owners will close the paper mill instead."

Many other people work at the paper mill. They spend the money they get from their jobs in the town. So the town needs the paper mill too.

But some other towns around there get water from the river too. They don't like the pollution in the river from the paper mill.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?
Tell us your ideas in the answer book.

STORY SIX

"The Auto Factory"

Jo Lynn, her mother and baby brother Timmy live near a big automobile factory in a large city. The family has no father. So Jo Lynn's mother works at the plant. Each day many cars are made there.

There is a lot of dirt in the area where Jo Lynn lives. Some people blame the auto plant for some of this. They say the dirt in the air comes from there. They say the plant owners should stop putting dirt into the air.

The plant owners say stopping air pollution would cost too much. They would have to get more money for the new cars made in the plant. What if the people could not pay the higher prices? The cars would not be sold. Then the auto plant would have to close.

Jo Lynn's mother needs a job. She has to work to get money for Jo Lynn and Timmy.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?
Tell us your ideas in the answer book.

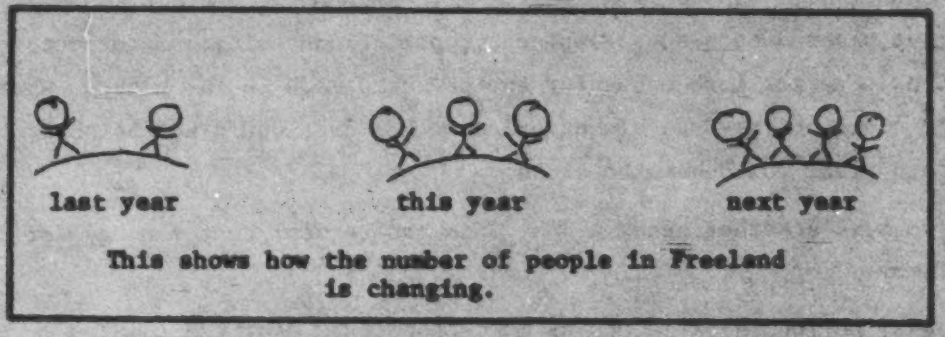
The picture shows the city where Jo Lynn and her family live.

STORY SEVEN

"Freeland"

You live in a country called Freeland. Each year there are many more people in Freeland than the year before. Last year, there were 2,000 people. This year there are 3,000 people. Next year, people think there will be 4,000 people.

Families in Freeland are big. There are seven or eight children in many families.



This shows how the number of people in Freeland is changing.

Some people say having more people in Freeland is good for the country. More people can build more things. Freeland could make money selling these things to other countries. So then Freeland could have nicer homes, parks, schools, and so on.

Other people say Freeland will soon be too crowded. There might not be enough food. People could be too crowded together. Then living in Freeland would not be so nice.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?
Tell us your ideas in the answer book.

Here are some of the children who live in Freeland.

STORY EIGHT

"Clear-Cutting"

Jim's family was visiting a big National Forest on their vacation.

"Hey, dad, what are all those bare spots in the forest?" Jim asked.

"Those bare spots are places where lumber companies have cut down all the trees," answered his father. "They call it clear-cutting."

"Why do they cut down all the trees?" Jim wondered.

The open spots in this picture are places that have been clear-cut.

Jim's father said that lumber companies rent some of the land from the government. The companies say that cutting down all the trees in one place saves money. It is faster and less work. If only some of the trees were cut, it would take more time to get them out of the forest. The lumber companies also say some kinds of trees that make good lumber grow better when clear-cutting is used.

Jim thought,"I guess we do need lumber. The more people there are, the more lumber we need to build houses and things."

Some people say that clear-cutting ruins the homes of many animals like squirrels and chipmunks. When all the trees are cut down, soil can be washed away easier. These people say the clear-cut places in the forest look ugly.

Other people say clear-cutting would be better if smaller areas were cut. Then the bare spots would not be so big.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

STORY NINE

"Smithville"

Donna and Carol live in a small town called Smithville. On their way home from school, they pass the only factory in town. Donna's father works at the factory.

"Boy, look at all the smoke coming out of that chimney," said Carol. "It sure makes the air smelly. Maybe the owner should be told to stop all that dirt from going into the air."

"My dad said the owner would close the factory if he had to stop all that smoke," Donna said. "He can't afford to stop the smoke."

But the air pollution coming from the factory is smelly and dirty. A lot of it could make you sick. Many visitors to Smithville think the air is not clean.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?

Tell us your ideas in the answer book.

This is a picture of the only factory in Smithville.

STORY TEN

"Cedar City"

Linda and her family live in Cedar City. On the way to school one day, Linda saw a lot of cans, bottles and other garbage lying around. She saw them in vacant lots, in the river and around the park.

That day her teacher talked about this problem. "Cedar City has grown over the last few years," said the teacher. "This means more garbage to get rid of."

Some people say the local company that makes soda pop is partly to blame. They are selling soda pop in cans and throw-away bottles. These quickly become garbage. Some people say it would be better for the soda pop company to sell soda in returnable bottles. These bottles could be used over and over again, not just once.

The soda pop company says that supermarkets in Cedar City do not like returnable bottles. They take up too much space. It is easier and cheaper for supermarkets to sell soda pop in cans and throw-away bottles.

Some people want a law to stop the selling of soda pop in cans and throw-away bottles in Cedar City.

WHAT DO YOU THINK SHOULD BE DONE ABOUT THIS PROBLEM?
Tell us your ideas in the answer book.

This picture shows some of the things Linda saw lying around the park.

Name_____

School_____ Circle one: BOY GIRL

Grade____ Date_____

ANSWER BOOK FOR

"STORIES ABOUT REAL LIFE PROBLEMS"

INSTRUCTIONS: Today you will read about some real life problems. Then you can tell us your ideas about each problem in this answer book. But DON'T WORRY about right answers. There are NO right answers. Just tell us what you feel. Turn the page now to see how to tell us your ideas.

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USOE Project number 2-E-026
Grant Number OEG-5-72-0045(509)

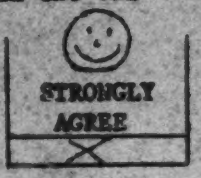
On the next pages, there are some student's ideas on solving each problem in STORIES ABOUT REAL LIFE PROBLEMS. We would like to know how you feel about these ideas. All you do is put an X in the box that says how you feel about each idea. The faces help tell how you feel.

Here is a sample:

IDEA ABOUT THE STORY	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
The people in the story should solve the problem.					

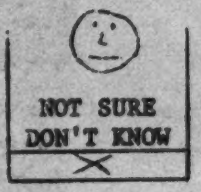
FIRST, you read the story about this problem in the book called STORIES ABOUT REAL LIFE PROBLEMS. Look at the picture which helps tell the story. Then, read the ideas about the story in this answer book. Decide what you feel about each way of solving the problem. Then, for each idea, put your X in the ONE box which tells how you feel about that idea.

If you like the idea a lot, put your X in the box marked STRONGLY AGREE.

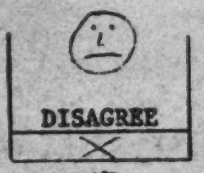


If you like the idea a little bit, put your X in the box marked AGREE.

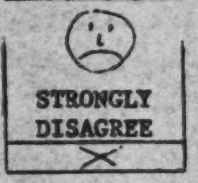
If you are not sure about this idea, put your X in the middle box, NOT SURE or DON'T KNOW.



If you kind of DON'T like the idea, put your X in the DISAGREE box.



If you don't like the idea at all, put your X in the STRONGLY DISAGREE box.



Turn the page to practice telling us your ideas.

Practice marking the following ideas: Just put your X in the ONE box that tells how you feel about each idea.

IDEAS TO PRACTICE ON:	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
We should have more time in school to get our homework done.					
Summer vacation is too long.					
Cats make better pets than dogs.					
Watching T.V. is boring.					

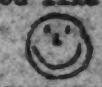
If you have any questions, raise your hand.

If you understand how to tell us your ideas, then you can start.

READ the FIRST story in the book called STORIES ABOUT REAL LIFE PROBLEMS.

The story is about "Newtown". Then, follow the directions below.

Here are some student's ideas on solving this problem. Read ALL the ideas first. Then, mark each idea with an X in the box which says how you feel about the idea. When you are done marking each idea, put a check (✓) in the box next to the ONE idea you like best.

Best Idea: (check one)	IDEAS ABOUT NEWTOWN (story 1)	 STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
☐	1. Use the land for factories which don't pollute. Jobs and money are important for Newtown.					
☐	2. Don't use the land for another highway. There are enough roads now.					
☐	3. Newtown has enough parks now for people to relax in. Use the land for something else.					
☐	4. Use the land for train or bus routes.					

5. If I lived there, I could help solve this problem. Circle one: YES NO

GO ON TO THE NEXT PAGE.

Now, read the story about "The School Tree". It is story TWO in your book.

Here are some student's ideas on solving the problem. Read <u>all</u> the ideas first. Then, mark each idea with an X in the box which says what <u>you</u> feel about the ideas. When you are done, put a check (✓) in the box next to the BEST idea.

Best Idea: (check one)	IDEAS ABOUT THE SCHOOL TREE (Story 2):	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
☐	6. Cut the tree down before someone gets hurt.					
☐	7. Don't do anything. Leave the tree alone.					
☐	8. Put a fence around the tree to keep children and cars away.					
☐	9. Move the tree someplace else. This will make more room for cars and children.					

10. If I lived there, I could help solve this problem.

Circle One YES ——— NO

GO BACK to the story book. Read story THREE. It is about wilderness.

When you finish reading, turn this page.

Some students wrote their ideas on solving this problem. Read all the ideas first. Then, mark each idea with an X in the box which says what you feel about the idea. When you're done, put a check (✓) in the box next to the BEST idea.

Best Idea: (check one)	IDEAS ABOUT WILDERNESS (Story 3):	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
☐	11. Wilderness areas are beautiful. But they would not be harmed by more roads and campgrounds.					
☐	12. The most important thing in this story is for the Jackson family to decide whether to go camping or not.					
☐	13. Wilderness areas should not have a lot of people in them. So leave wilderness just for hiking.					
☐	14. Wilderness belong to all the people. Build more roads and campgrounds so more people can enjoy them.					
☐	15. Build more roads and campgrounds in some Parks. Save others just for hiking.					

16. I think I could help solve this problem. Circle one: YES NO

Now, read story FOUR in the story book. It is about strip mining.

When you finish reading, turn this page.

Here are some students ideas on solving this problem. Read all the ideas first. Then put your X in the box which says what you feel about each idea. Mark the best idea with a check in the box next to it.

Best Idea: (check one)	IDEAS ABOUT STRIP MINING (Story 4):	STRONGLY AGREE	AGREE	NOT SURE DON'T SURE	DISAGREE	STRONGLY DISAGREE
☐	17. Stop all strip mining. It ruins the land. Use tunnel mines instead.					
☐	18. Only use strip mines in some places. Fill in the land afterward.					
☐	19. Keep strip mines. We need the coal from them. They are safer than tunnel mines.					
☐	20. The most important reason to stop strip mining is to save animal's homes.					

21. If I lived there, I could help solve this problem. Circle one: YES NO

Now read story FIVE in the story book. It is about the paper mill.

Some students wrote their ideas on solving this problem. Read all the ideas first. Mark each idea with an X in the box which tells what you feel about the idea. Put a check (✓) in the box next to the BEST idea.

Best Idea: (check one)	IDEAS ABOUT THE PAPER MILL (Story 5):	STRONGLY AGREE	AGREE	NOT SURE DON'T KNOW	DISAGREE	STRONGLY DISAGREE
☐	22. Try to do something about water pollution. But keep the mill open. The town needs it.					
☐	23. Put in a filter to stop the pollution.					
☐	24. Put the mill away from the water. Dump stuff somewhere else.					
☐	25. The town should not help the mill get money to stop the pollution. Let the mill owner pay.					

26. If I lived there, I could help solve this problem. Circle one: YES NO

Please read story SIX in your book. It is about the auto factory.

When you finish reading, turn this page.

Some students wrote their ideas on solving this problem. Read all the ideas first. Then, mark each idea with an X in the box which says what you feel about it. Mark the best idea with a check (✓) in the box next to it.

Best Idea: (check one)	IDEAS ABOUT THE AUTO FACTORY (Story 6):	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
☐	27. Get a machine which keeps dirt out of the air.					
☐	28. The best way to solve the problem is for Jo Lynn's family to move away, or her mother get another job.					
☐	29. Shut down the factory to stop the pollution.					
☐	30. Raise car prices to pay for something to keep the air clean.					

31. If I lived there, I could help solve this problem. Circle one: YES NO

Now, read the next story in the reader. It is story SEVEN, about Freeland.

Here are what some students said about solving this problem. Read all the ideas first. Then, mark the ideas like before.

Best Idea: (check one)	IDEAS ABOUT FREELAND (story 7):	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
☐	32. This is not really a problem. There is plenty of land outside cities for people to live on.					
☐	33. Grow more food for the people, or buy food from other countries.					
☐	34. Start a program to get parents to have smaller families.					
☐	35. Get more land to make Freeland bigger.					
☐	36. Stop people from coming to Freeland. Let some move away.					
☐	37. Pass a law to make parents have fewer children.					

38. If I lived there, I could help solve this problem. Circle one: YES NO

Now, please read the story about Clear-Cutting in the story book. It is story EIGHT.
When you finish reading, turn this page.

Here are some student's ideas on solving this problem. Read all the ideas first. Then mark each with an X in the box which tells how you feel about the ideas. Put a check ( ) in the box next to the BEST idea.

Best Idea: (check one)	IDEAS ABOUT CLEAR-CUTTING (Story 8)	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
	39. Only clear-cut <u>some</u> places in the forest. Then plant new trees.					
	40. Stop the clear-cutting. It ruins too many things. Get <u>lumber</u> some other way.					
	41. Watch out for animals, but it is O.K. to clear-cut. We need lumber that costs less.					

42. I could help solve this problem.

Circle one: YES NO

Now read story NINE in the story book. It is about Smithville.

Here are some student's ideas on solving this problem. Read all the ideas first. Then mark each idea with an X in the box which says what <u>you</u> feel about the idea. Mark the best idea with a check (✓) in the box next to it.

Best Idea: (check one)	IDEAS ABOUT SMITHVILLE (Story 9):	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
☐	43. Keep the factory open. Jobs are more important than <u>a little air pollution.</u>					
☐	44. Put a filter on the chimney to stop the smoke.					
☐	45. The best thing to do is for Donna's father to get another job, or the family <u>move away.</u>					
☐	46. The town should help the owner raise money to stop the smoke.					

47. If I lived there, I could help solve the problem. Circle one: YES NO

Now, read the last story in your reader (story TEN). It is about Cedar City.

When you are finished reading, turn this page.

Here are some student's ideas on solving this problem. Read all the ideas first. Then mark each idea with an X in the box which says what you feel about the idea. Put a check (✓) in the box next to the best idea.

Best Idea: (check one)	IDEAS ABOUT CEDAR CITY (Story 10):	STRONGLY AGREE	AGREE	DON'T KNOW NOT SURE	DISAGREE	STRONGLY DISAGREE
☐	48. The best way to solve the problem is to stop throwing trash around. Put it in garbage cans.					
☐	49. People should be able to get soda pop in cans or bottles. Then you can buy what you want.					
☐	50. Pass a law to fine people who litter.					

51. If I lived there, I could help solve this problem. Circle one: YES NO

52. Think about where you live. This means your home, your school and the other nearby places you sometimes go to. Do you think there are any problems around here like any of the ones you read about?

Circle one: YES NO

If you say YES, can you name or tell about any problems? Write it here: _____

_____

_____

If you said there were problems around here, do you think you could help solve these problems?

Circle one: YES NO

+ + + +

Appendix K

Word-Pair Characteristics of Field Test Version of Semantic Differential

Appendix K-1

Word-Pair Characteristics for Field Test Version of Semantic Differential

"Our World of Today"

N=665 Students

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Comment?
Pretty	N	72	141	308	89	54	Ugly	OK
	RAVE wt.	7	6	4	2	1		
	r biser.	.78	.44	-.10	-.51	-.82		
Neat	N	33	47	163	233	189	Littered	OK
	RAVE wt.	7	6	5	4	2		
	r biser.	.89	.59	.27	-.07	-.68		
Good	N	100	140	264	93	66	Bad	OK
	RAVE wt.	7	5	4	2	1		
	r biser.	.78	.24	-.06	-.48	-.83		
Sweet-smelling	N	54	128	303	109	71	Stinking	OK
	RAVE wt.	7	6	4	2	1		
	r biser.	.77	.48	.05	-.45	-.84		
Pleasant	N	106	212	205	77	61	Unpleasant	OK
	RAVE wt.	6	5	4	3	1		
	r biser.	.74	.25	-.16	-.38	-.84		

Appendix K-1 (cont.)

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Comment?
Sunny	N	161	215	207	46	35	Rainy	Weak discrimination
	RAVE wt.	6	5	3	3	1		
	r biser.	.52	.19	-.27	-.27	-.89		
Healthful	N	97	154	242	106	62	Sickening	OK
	RAVE wt.	7	5	4	3	1		
	r biser.	.73	.40	-.13	-.44	-.79		
Nice	N	124	218	209	63	50	Awful	OK
	RAVE wt.	7	5	3	2	1		
	r biser.	.83	.29	-.29	-.53	-.92		
Clean	N	38	107	231	168	120	Dirty	OK
	RAVE wt.	7	6	5	3	2		
	r biser.	.81	.54	.20	-.27	-.79		
Safe	N	64	126	247	133	94	Dangerous	OK
	RAVE wt.	7	6	4	3	2		
	r biser.	.64	.44	.04	-.32	-.69		

Appendix K-2

Word-Pair Characteristics for Field Test Version of Semantic Differential

"Our World of Tomorrow"

N=665 Students

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Comments?
Healthful	N	158	148	157	104	95	Sickening	OK
	RAVE wt.	7	5	4	3	2		
	r biser.	.87	.31	-.09	-.49	-.91		
Clean	N	155	167	127	103	110	Dirty	OK
	RAVE wt.	7	6	4	3	1		
	r biser.	.87	.36	-.07	-.42	-.99		
Sunny	N	190	155	155	84	78	Hazy	OK
	RAVE wt.	6	5	4	3	1		
	r biser.	.78	.24	-.13	-.43	-1.00		
Nice	N	179	150	173	87	73	Awful	OK
	RAVE wt.	6	5	4	2	1		
	r biser.	.89	.25	-.18	-.57	-.95		
Pleasant	N	166	147	168	91	86	Unpleasant	OK
	RAVE wt.	7	5	4	2	1		
	r biser.	.88	.29	-.14	-.49	-.96		

Appendix K-2 (cont.)

Optimistic Positive Pole		Response Position One	Two	Three	Four	Five	Pessimistic Negative Pole	Comments?
Good	N	167	163	173	74	84	Bad	OK
	RAVE wt.	7	5	3	2	1		
	r biser.	.88	.28	-.18	-.53	-.93		
Neat	N	145	138	142	106	129	Littered	OK
	RAVE wt.	7	6	5	3	2		
	r biser.	.88	.32	.03	-.36	-.94		
Sweet-smelling	N	142	138	180	103	98	Stinking	OK
	RAVE wt.	7	6	4	3	1		
	r biser.	.83	.39	-.01	-.49	-.95		
Pretty	N	159	157	165	99	81	Ugly	OK
	RAVE wt.	7	6	4	2	1		
	r biser.	.86	.32	-.12	-.54	-.94		
Safe	N	143	120	180	93	124	Dangerous	OK
	RAVE wt.	7	6	5	3	2		
	r biser.	.84	.34	.00	-.37	-.88		

Appendix L

Item Characteristics of Field Test Version

of Likert Based Instrument

"Some Ideas I Have"

Appendix L

Item Characteristics of Field Test Version of Likert Based Instrument

"Some Ideas I Have"

N=661 Students

Item		Response Positions 1 SA	2 A	3 NS	4 D	5 SD	Item Mean	Variance	Comments
3. I worry about the environment (problems like pollution).	N	275	198	136	30	21	1.98	1.11	Improved scalability and correlation. Mean and response distribution slightly worse.
	RAVE wts.	6	5	2	1	1			
	r biser.	.39	.05	-.34	-.46	-.40			
4. From now on, people getting married should have no more than two children.	N	61	67	142	157	233	3.66	1.70	Improved variance.
	RAVE wts.	7	6	6	3	4			
	r biser.	.38	.23	.15	-.20	-.23			
5. I cannot find and help solve environmental problems around where I live.	N	36	89	210	176	148	3.46	1.33	Improved scalability and variance.
	RAVE wts.	3	2	3	6	7			
	r biser.	-.25	-.28	-.23	.21	.35			
6. Soon there may be too many people living on the earth.	N	158	212	176	73	38	2.44	1.37	Improved scalability.
	RAVE wts.	7	5	4	2	1			
	r biser.	.41	.08	-.13	-.30	-.47			

Appendix L (cont.)

Item		Response Positions 1 SA	2 A	3 NS	4 D	5 SD	Item Mean	Variance	Comments
8. If a person's car makes too much air pollution, he should not be allowed to drive it.	N	169	172	140	126	52	2.59	1.65	Greatly improved response distribution, mean and variance. Discrimination of middle responses weak.
	RAVE wts.	6	4	4	4	1			
	r biser.	.30	.00	-.04	-.10	-.40			
10. The cause of many problems in the world today is too many people.	N	90	159	186	168	56	2.92	1.40	Improved mean, variance and distribution.
	RAVE wts.	7	6	4	4	3			
	r biser.	.37	.16	-.11	-.17	-.24			
11. I want my neighborhood kept clean. Everyone should pick up his own litter. I should not have to pick up someone else's mess.	N	325	170	57	59	47	1.98	1.59	Improved response distribution and variance. Weaker negative correlations. Poor discrimination.
	RAVE wts.	5	4	5	5	7			
	r biser.	-.11	-.11	.12	.10	.34			
13. Usually, it is best to write on just one side of a piece of paper.	N	50	67	105	234	205	3.72	1.48	[New item on this test] RETAIN (See Table , p.
	RAVE wts.	2	2	3	4	7			
	r biser.	-.30	-.27	-.17	-.08	.46			
16. I think there are a lot of pollution problems I can help stop.	N	183	209	199	47	18	2.28	1.15	Distribution slightly improved. Slightly weak positive correlations.
	RAVE wts.	6	5	4	4	1			
	r biser.	.26	.01	-.12	-.12	-.44			

Appendix L (cont.)

Item		Response Positions 1 SA	2 A	3 NS	4 D	5 SD	Item Mean	Variance	Comments
17. Soda pop should be sold only in bottles that can be used again, not in cans.	N	262	138	104	85	71	2.35	1.94	Improved scalability.
	RAVE wts.	7	5	3	1	2			
	r biser.	.53	.00	-.17	-.40	-.42			
18. Don't waste the best T.V. time with programs about pollution.	N	54	95	206	167	135	3.34	1.48	Improved scalability. Excellent item.
	RAVE wts.	1	2	3	6	7			
	r biser.	-.55	-.31	-.15	.16	.54			
19. I would get rid of old newspapers by burning them. This is an easy way.	N	33	59	117	168	278	3.88	1.54	Improved in <u>all</u> item statistics.
	RAVE wts.	2	2	1	4	7			
	r biser.	-.31	-.33	-.36	-.02	.51			
20. Walking in the woods is not as much fun if too many people are there.	N	223	205	115	64	54	2.28	1.56	Improved discrimination.
	RAVE wts.	6	5	3	2	3			
	r biser.	.32	.05	-.20	-.29	-.22			
22. If wild animals need a safe home, it would be best to put them in a nice zoo.	N	99	123	96	120	223	3.37	2.18	Improved distribution, mean and variance. <u>Slight</u> discrimination problem.
	RAVE wts.	2	2	5	5	6			
	r biser.	-.33	-.30	.06	.07	.34			

Appendix L (cont.)

Item		Response Positions 1 SA	2 A	3 NS	4 D	5 SD	Item Mean	Variance	Comments
23. Milk at school should come in bottles that can be used over, not paper cartons.	N	105	144	168	148	94	2.98	1.68	Improved scalability. Good item.
	RAVE wts.	7	6	5	2	2			
	r biser.	.40	.20	.04	-.30	-.34			
24. Parents should have as many children as they want.	N	218	184	137	63	56	2.31	1.60	Improved scalability. Correlation problems, response positions 3 and 4.
	RAVE wts.	2	4	6	6	7			
	r biser.	-.39	-.14	.30	.20	.46			
25. If my dad owned a marsh or woods where some animals lived, I would like part of it made into a playground (like at school).	N	19	46	101	161	330	4.10	1.28	Poor distribution, mean and variance. Also discrimination problems. (Original item probably better.)
	RAVE wts.	1	1	1	5	6			
	r biser.	-.45	-.44	-.42	.02	.47			
27. There is too much on T.V. about problems with pollution.	N	39	72	189	210	150	3.54	1.29	Improved distribution and scalability.
	RAVE wts.	1	1	2	6	7			
	r biser.	-.44	-.39	-.29	.17	.53			
28. Children worry too much about problems of the environment (like pollution problems).	N	35	75	177	224	146	3.54	1.31	Improved, though still weak correlations.
	RAVE wts.	4	2	3	5	7			
	r biser.	-.17	-.31	-.22	.12	.38			

Appendix L (cont.)

Item		Response Positions 1 SA	2 A	3 NS	4 D	5 SD	Item Mean	Variance	Comments
29. Motorbikes and motorcycles should be made more quiet.	N	170	219	143	76	50	2.43	1.50	Weak negative correlations.
	RAVE wts.	6	5	3	3	4			
	r biser.	.28	.10	-.18	-.21	-.18			
30. People (like me) are the cause of most pollution problems.	N	99	172	198	105	84	2.87	1.55	Improved response distribution, mean and variance. Weak correlations.
	RAVE wts.	6	5	4	4	3			
	r biser.	.21	.14	-.04	-.11	-.23			
31. We have enough parks and forests now for wild animals to live in.	N	56	75	139	184	203	3.60	1.67	Good item.
	RAVE wts.	1	1	3	5	7			
	r biser.	-.50	-.39	-.18	.28	.31			
32. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.	N	50	74	136	165	236	3.70	1.60	Improved scalability. Good item.
	RAVE wts.	1	1	3	5	7			
	r biser.	-.53	-.44	-.21	.07	.53			
34. There is not much <u>one</u> person can do to help the environment and stop pollution.	N	113	125	134	151	136	3.10	1.94	Better response distribution and mean, variance. Weak correlations, discriminations, positions 1-3.
	RAVE wts.	3	3	3	5	7			
	r biser.	-.23	-.16	-.16	.05	.47			

Appendix L (cont.)

Item		Response Positions 1 SA	2 A	3 NS	4 D	5 SD	Item Mean	Variance	Comments
35. It is O.K. for the number of people living in our country to increase. (This means more people would live here.)	N	45	87	277	123	126	3.29	1.31	Improved scalability. Good item.
	RAVE wts.	1	2	4	6	7			
	r biser.	-.42	-.36	-.18	.28	.48			

Appendix M

The Black Anomaly

Appendix M

The Black Anomaly

In research the unexpected results are often the most interesting. The "Black Anomaly" was just that.

This group's low Hoyt r (.19), was eons apart from those of other groups. The school was in an inner city, ghetto area. Decaying buildings and vacant lots awaiting urban renewal were common sights in the vicinity. Absenteeism was high. For example, the 16 students were supposed to be 31. The teacher indicated that most of the absentees attend infrequently, and characterized the others as those who still "care a little" about getting something out of school.

A first thought was that these children were trying to "goof up" the results. Maybe they resented "outsiders." But this same group had high reliabilities on the "Our World" scales, which they took the same period as "Some Ideas". [Hoyt r's of .87 and .95 on "Today" and "Tomorrow", respectively.]

Also, there was no overt or covert sense of hostility. While these students were not the most enthusiastic group in the field test, they were cooperative. Each student seemed to be thinking about every statement before making his answer--no random answers here.

If the explanation for this anomaly didn't lie in any purposeful actions of the students, might it be due to some ethnic orientation possibly combined with local environmental influences? Results were checked for the fifth grade groups. A group of Black, fifth graders in another school just three blocks from the eighth grade school also had the lowest internal consistency among fifth grade students [Hoyt r of .50 compared with the next lowest value of .62].

Of course, the low value of .19 for the eighth graders was partially due to small sample size. But since the fifth grade Blacks also had a low internal consistency on "Some Ideas" with an adequate sample size, the "cause" for this difference seemed worthwhile pursuing.

At this point, it might be well to reiterate what Hoyt reliability estimates indicate. This instrument was set up on the basis of "environmental-responsibility"---and each item was scored on that basis. A high reliability can come either from a person consistently marking responses indicating high environmental-responsibility, or consistently giving opposing responses. Low Hoyt r's result when the responses are "all over the place"--sometimes environmentally-responsible, sometimes not. The Hoyt reliabilities for the fifth grade groups, and for the eighth grade groups indicated that, regardless of the variations, scores for individuals within groups tended to be internally consistent--except for the Black children.

Of course, not all test items were answered in an environmentally responsible fashion by the majority of students in the

field test. Three and four items for eighth and fifth graders, respectively, were consistently answered by the majority of the group in a non-environmentally responsible fashion. For eighth graders these items were numbers 4 and 24 (on overpopulation) and 11 (picking up someone else's litter); for fifth graders these items plus number 10 (also on overpopulation) were answered in opposing fashion. All other items on "Some Ideas" were answered by a majority of the entire group of students in an environmentally-responsible fashion.

Ten additional items were marked in the opposite fashion by the majority of either fifth and/or eighth grade Blacks. These included every overpopulation item on the test, as well as items on recycling and personal responsibility for and ability to alleviate pollution. This large number of opposite responses in the test lowered the Hoyt r for the eighth grade Blacks (particularly due to the small sample size) and also significantly lowered the Hoyt r for the larger fifth grade Black group.

The items on which the Black children exhibited low environmental responsibility by our criteria follows, excluding items reacted to in a non-environmentally responsible manner.

5. I cannot find and help solve environmental problems where I live. (grade 5 only)

6. Soon there may be too many people living on the earth.

17. Soda pop should be sold only in bottles that can be used again, not in cans.

22. If wild animals need a safe home, it would be best to put them into a nice zoo.

23. Milk at school should come in bottles that can be used over, not paper cartons.

27. There is too much on TV about problems with pollution. (grade 5 only)

30. People like me are the cause of most pollution problems.

31. We have enough parks and forests now for wild animals to live in. (grade 5 only)

32. Use a lot of weed-killer in your garden, so you won't have so many weeds to pull.

35. It is OK for the number of people living in our country to increase. (This means more people would live here.)

By their responses, the Black children "set themselves apart" from other children in the study. For example, recycling (#17) was not important, according to 43.8% of eighth grade Blacks. Yet it was deemed important by 67.2% of all eighth graders.* Personal responsibility for causing pollution (#30) was acknowledged by 41.6% of all fifth graders. Yet 56.6% of the Black fifth graders disagreed.

The results suggest that Black youth see no need to worry about overpopulation. As for other environmental problems, they didn't cause them, and they can't help solve them. Such a picture fits in with the often-voiced attitudes of many militant Blacks: "The Environment" is an excuse for the white power structure to ignore (the Black) problems of poverty and ghetto life.

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* These percentages were obtained by summing the "Strongly Agree" and "Agree" responses, and also the "Disagree" and "Strongly Disagree" responses.

Appendix N

Student Information Sheet

STUDENT
INFORMATION SHEET

NAME_____

Age_____School_____ Circle one: BOY GIRL

Grade_____Date_____

To help us understand you and your ideas better, please tell us:

1. What job does your father have?_____

2. What job does your mother have?_____

3. Do you live near enough to walk to this school? (Circle one) YES NO

4. If you ride a bus to school, how long does it take? _____minutes.

5. Have you always lived in the same city or place you live now?

   Circle one: YES NO (If no, please answer the questions below)

   a. How long have you lived where you live now?_____

   b. Where was the last place you lived?_____

   c. How long did you live there?_____

   d. Where was this place? CHECK ONE:

_____It was in a big city.
_____It was near a big city.
_____It was in a small town.
_____It was near a small town.
_____It was on a farm.

THANK YOU.